THE CULTIVATOR,

A MONTHLY PUBLICATION,

DESIGNED TO

IMPROVE THE SOIL AND THE MIND.

PUBLISHED BY THE NEW-YORK STATE AGRICULTURAL SOCIETY,

AND

CONDUCTED BY J. BUEL, J. P. BEEKMAN AND J. D. WASSON.

VOLUME I. SECOND EDITION.

☞ In this second edition, we have retained all the matter that can *now* be of use to the reader—the receipt of moneys, Price Current, &c. being omitted.

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ALBANY, MARCH, 1834.

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TO IMPROVE THE SOIL AND THE MIND.

In behalf of the society who have assumed the proprietorship of the CULTIVATOR, we tender our thanks to the Post-masters and other gentlemen who have interested themselves in procuring subscribers for it. So far as returns have been received, the patronage is liberal—the number from a post-office seldom falling short of twenty, and frequently amounting to fifty, sixty and seventy. As the sole object of the publication is to disseminate useful information, in the cheapest possible form; and as the profits of subscription, if any accrue, will be applied to the improvement and embellishment of the work, we hope to stand excused for repeating our request, to all who are anxious to promote the improvement and prosperity of our country, to aid in its circulation, by their patronage and influence. We disclaim any wish to lessen the patronage of other agricultural journals. These, so far as we are acquainted with them, are producing important benefits, are well conducted, and are deserving of a better support than they receive. But they occupy but a small portion of the ground;—they do not reach one in sixty of our agricultural population. We seek to improve the unoccupied ground, in order to fit it for higher products. And in the mean time we hope to make our paper so useful, that gentlemen will be willing to ADD this to the periodicals which they already patronize. The low price at which this sheet is offered, is no criterion of what other journals can be afforded at. Our terms are predicated upon a large circulation, and are intended to cover merely the expense of paper and mechanical labor, and the latter greatly abridged by the economy of a steam printing press. Other journals are subject to heavy charges for services which are here gratuitous. It is for these reasons that we cannot employ, or pay agents, or commissions, and that we appeal to the liberal minded to volunteer their aid in extending the circulation of the paper.

TO THE READER.

In presenting this specimen, we have a few remarks to make to those for whose benefit it is mainly intended.

To the FARMER, the CULTIVATOR will communicate the best practices in farming, and afford occasional illustrations, in a plain style, of some of the principles upon which good husbandry is based. It will aim to render his labors more profitable and more respectable;—to produce system and economy upon the farm;—and intelligence, virtue and happiness in the domestic circle. There are more than 250,000 farmers in the state, not more than 5,000 of whom, or one in two hundred and fifty, it is believed, have access to an agricultural paper, or possess other means, except that of casual observation, of knowing the daily improvements which are making in their particular business. The reasons of this are, that they either cannot procure such papers, or that they are unable to pay for them—neither of which can apply in this case, as the cost of the CULTIVATOR, including postage, is too trivial to be objected to, and the mail will afford a certain and regular mode of obtaining them.

The MECHANIC is already, or expects at some future time to be, the cultivator of a garden, if not a farm. He will stand in need of instruction in his new art. This the CULTIVATOR will afford him. We shall, besides, advise him of the new discoveries and improvements which are likely to benefit his craft; and at all times endeavor to give him a two-penny-worth of rational entertainment.

The YOUNG MEN we would specially appeal to. You are destined soon to occupy the stage of public action, and to fill the important stations in society. *Now* is the time to *prepare* for these high duties, as well as for profit and distinction in your business. Your characters are but partially formed, and are yet susceptible of receiving good or bad impressions, which are to last through life. It is important to you, to your friends, and to society, that these impressions should be for good. We will lay before you rules and examples of the wisest and best men, to aid you in the formation of your characters—to enable you to become intelligent and successful in your business,—useful and respectable in society,—and beloved and happy in your families. Do not object that you have no *time* to read. Few young men labor more hours than did Benjamin Franklin, or are more humble and self-dependent than he was in his youth; and yet Franklin found abundant time for self-instruction; and so indefatigable and successful was he in his studies, that he became one of the most useful and celebrated men of his age. We need not limit the remark to Franklin: most of the distinguished men of the day have risen from humble stations by their own industry and frugality, and have acquired a great share of their knowledge in the hours not allotted to ordinary business. Your winter evenings are your own, and may be applied usefully. They may be computed at one-fourth of the day, or one entire month in a year. Time is money: and the young man who appropriates this month to the acquiring useful knowledge, does more to add to his future fortune, to say nothing of his intellectual wealth, than if he received pay for this month and loaned it upon interest. Knowledge is in another respect like money: the greater the stock of it on hand, the more it will administer to the respectability and enjoyments of life. But knowledge is not to be acquired without exertion, nor is any thing else that is useful in life. It is the labor we bestow in acquiring an object that imparts to it an intrinsic value. It has been well said, that "although we may be learned by the help of others, we can never be wise but by our own wisdom." It is the humble design of this monthly sheet to excite a laudable ambition to improve the mind as well as the soil. If we succeed in awakening the latent energies of the former, we think the latter will follow as a natural consequence, and our object will be attained.

We invite other classes of society than those we have addressed, to patronize this work. The subjects that relate to husbandry embrace a wide field of knowledge, and constitute some of the richest sources of intellectual enjoyment. We hope to make the Cultivator a cheap source of pleasure to all.—*Specimen Sheet.*

To the Executive Committee of the N. Y. State Agricultural Society.

The Corresponding Secretary of the New-York State Agricultural Society, having been prevented by indisposition, from attending the annual meeting in February, and making his report for the year 1833, now begs leave to do it through its Ex. Committee. It was made the duty of the Corresponding Secretary, by resolution of the society, passed at its meeting in February, 1833, to return the thanks of the society to Dr. William Darlington, of Pennsylvania, for his able and lucid communication to the society, on the "use of lime in agriculture;" and likewise "to Major John Adlum, of Georgetown, District of Columbia, for the book containing a treatise on the culture of the vine, and on the manufacture of wine from the produce of it; and for a box containing a sample of the wine so manufactured." The corresponding secretary has, in both these instances, performed the duty assigned him. It was likewise made the duty of the corresponding secretary, by resolution of the society, that he "address a circular to the presidents of the county agricultural societies already organized, or which may be formed the present year, requesting them to transmit to this society, at its annual meeting, an account of their several proceedings, with their views of the means best adapted to improve our husbandry, and to diffuse useful knowledge among those who manage its labors." The corresponding secretary has performed that duty, as far as the names of the officers of the county societies which were organized in this state could be ascertained, but he has received no communications from them in furtherance of the views of the society, and he is yet very imperfectly informed of the number of the county agricultural societies there are in this state, who are their officers, and whether they are auxiliary to the state society. While he regrets that this act of courtesy on the part of the officers of the county societies has not been extended to the state society, yet he is happy to acknowledge, that in several of the counties in this state, which have organized societies the present year, he has had the pleasure to receive, from gentlemen connected with them, an account of such organization, and of the names of those who have been chosen its officers. To such gentlemen, in behalf of the society, he returns his thanks; and

he trusts that hereafter this act of courtesy will not be omitted by such other societies as may successively be formed in this state. Since our meeting in February, 1833, societies have organized, as far as I have been informed, in the following counties: Columbia, Albany, Rensselaer and New-York; and a re-organization has likewise been effected in Saratoga. No doubt there have been societies organized in other and more distant parts of the state, but in what particular counties I am unable to say, as in several of the western counties, agricultural societies, I perceive by the papers, are in a course of successful experiment. Most of these have had their exhibitions in the course of the last autumn, and I have not heard of a dissenting voice to the beneficial effects which have followed these first trials of agricultural skill and improvement. On the contrary, as far as public opinion could be gathered from the papers which have announced these meetings, they have spoken in warm commendation of the good effects which have already been experienced, and in anticipation that greater will follow. For myself, I attended a few of these exhibitions in neighboring counties and in my own, and in all instances was both gratified and amply rewarded for the time and money so spent. These exhibitions will annually become more useful as well as interesting, for as the respective societies increase their members, and have time to improve their internal organization, the subjects for premium will be more varied and better selected, the articles exhibited of better quality and in larger quantity. New fields of investigation will be opened, and the old ones more thoroughly and satisfactorily explored. The business, too, at their annual meetings will be more systematically conducted, and every thing connected with them assume a due course of improvement, so that they will command public approbation, and make advocates of those who are now unbelievers or neutrals. Besides the opportunity that is thus afforded by the meeting of these county societies for the exhibition of the best and varied kinds of stock, and all the available fruits of husbandry—and excited as their owners naturally will be by a laudable spirit of competition, which is still further increased by the hope of obtaining the badge of superiority —a premium—advantages of themselves sufficient to compensate for the little time and money they cost in our attendance upon them, farmers appear not to be aware of the great influence a well organized and conducted society will have upon the per acre price of their farms. To say it would be ten dollars per acre, after a few years of its existence, and its effects have been a little tested by time, would be surely saying little enough of what will hereafter be apparent. It must be obvious that when all of intellect in a whole community is brought to bear upon a single subject, with the zeal it naturally engenders, the new lights it constantly elicits, the improvements that must necessarily follow steps which all lead directly to the adoption of a better system, husbandry with these aids, will assume new forms and be rendered far more lucrative and attractive. Can it be otherwise then that our farms will be made more valuable, our pursuits more pleasant, our houses more comfortable, and our means more abundant? This concert of action will have the same effect in leading to important results that military combination and skill have over the uncombined and ill directed efforts of a disjointed but populous community. History teaches us that the united efforts of a few hundred have overcome thousands not so trained and connected. Let us avail ourselves of this lesson from history as applied to our particular pursuit, and by united effort, if it is guided by intelligence, our state will become as eminent for the successful cultivation of her soil, as she now is for the elevation which she has attained in her career of internal improvement. Providence has been bountiful to us, not only in our location, in giving us a healthy climate, a fertile soil, streams to float away our produce to the best markets, and strength of body to encounter the fatigues incident to the improvement of these great advantages,—but, has the mind heretofore borne her share with the toils of the body? My observation tells me not. Let us henceforward call her into active requisition, to aid the operations of our hands, and their joint labors will make our pursuits not only more pleasant, but infinitely more profitable. But what can concentration of effort effect without we have the aid of agricultural journals to inform the public mind? The answer must be—nothing. We have, however, these invaluable resources, and thanks to the intelligence of our community, they are daily becoming more numerous, interesting and instructive. It is but a few years since the first of these was established, and then it was more in the nature of an experiment. That day has gone by; the experiment, after years of trial, was successful, and we have now four valuable journals in circulation, and in successful operation in this state. From their reports, the numbers of their subscribers have materially increased within the last year, and it argues well for the public taste that political papers occasionally publish useful agricultural essays in their columns, as it clearly indicates a growing desire in their readers, who are generally farmers, for information upon their particular pursuit. The last year has been peculiarly auspicious on this subject. In every part of the state the calls for the publication of agricultural articles have been numerous, and cheerfully responded to, and the State Agricultural Society now makes its particular acknowledgments to editors of newspapers in every county in this state, for giving publicity to such communications as they have done themselves the honor to furnish them. We trust the editors of our state will continue to keep open their columns to all that tends to the improvement of agriculture, inasmuch as by their general circulation in all classes of our citizens, they diffuse most extensively whatever information they contain.

In conformity with a resolution of this society, Ambrose Spencer, Horatio Hickok and Jesse Buel were appointed a committee to report a memorial to the legislature, praying that legislative provision be made for a State Agricultural School. In conformity with the above resolution, a petition was prepared and presented to both senate and assembly, in February, 1833. In both branches reports favorable to the object solicited were made, and I must refer the society to the report of Mr. Sudam of the senate, and Gen. Skinner of the assembly, in which the advantages that would result from the establishment of such an institution are both ably and eloquently pourtrayed. In neither branch of the legislature were these reports acted upon. It was thought most judicious at first to inform the public of the object contemplated, and the purpose it was to answer, trusting that as the public mind became enlightened, it would perceive the necessity of the institution thus sought, the great benefits that would follow from it, and that if it met with a general approval, the public voice would at the proper time call for it. The call has been made: petitions from many counties in the state have this year been presented to the house; public bodies have given the project their sanction. The extremes of the state, from Long-Island to St. Lawrence and Erie, have united with the centre in a voice of approval, and the more the subject is canvassed, the more deep and abiding is the impression of the great benefits that will flow from the establishment of an agricultural school. In due time we trust our hopes will be consummated.

There has also been a general wish expressed within the last year, throughout every part of the state, for legislative aid to enable the county agricultural societies to offer and pay premiums for articles thought worthy of them. The object is extremely laudable in itself, and as the premiums are among the aliments essential to the existence of such societies, we trust the boon will not be denied. A resolution was likewise passed at the meeting of the State Agricultural Society, in 1833, that annual fairs be held at New-York and Albany, and that the first attempt be made in the then ensuing autumn. A correspondence was opened with the municipal officers of each of these cities to give effect to the resolution of the society. By an unavoidable delay, it could not be carried into effect in New-York, but it was in Albany. A fair was held under the auspices of this society at the latter place, which, although it was the first, fully met public expectation. It was visited by gentlemen from almost every portion of our state, by many from the eastern states, and those that were most competent to form an opinion of its merits, from having attended similar displays elsewhere, declared, that in the variety, excellence and value of the stock, particularly the cattle exhibited, the fair at Albany was most abundantly successful.

From the foregoing imperfect survey of the operations of this society for the last year, we have every inducement to persevere. We ought to be gratified at the success that has thus far crowned our efforts. We see hundreds of intelligent men springing up in every section of our state, willing to aid and share in our labors—the whole community alive and awake to the subject of farther improvement, and each individual member of it solicitous to perform his part in this general march of mind for the attainment of these great objects. It is only for the society to give a proper direction to these efforts, and make them subservient to the advancement of agricultural industry and prosperity, and her benefits will be felt and acknowledged throughout every portion of our state.

J. P. BEEKMAN, *Cor. Sec. N. Y. Ag. Society.*

Kinderhook, March 5, 1834.

MAPLE SUGAR.

As the season for its manufacture is at hand, we venture to offer some suggestions upon the subject, having been somewhat of a sugar boiler in our younger days.

The first care should be to preserve the trees. It is not safe in primitive woods, to cut away all the other timber, and to leave only the maples standing. In this way they are robbed of their protection, and are very liable to be prostrated by the wind. But trees growing in open situations adapt their forms to withstand the winds; and hence those which are termed second growth ought to be carefully preserved. Trees are often destroyed, in a few years, by injudicious *tapping*. We have seen them half girdled in a season, in order to increase the sap. The consequence is, that the wounds do not heal; the water lodges in the *boxes* and rots the wood; and the tree dies, or is broken off by the wind. A chissel and mallet are better than the axe to *tap* with, and a screw auger, two to five quarters in diameter, according to the size of the tree, is better than either—as the wound then soon closes, and little or no injury is inflicted on the tree. One or two holes may be bored on the south, and the like on the north side of the tree, if the size will warrant it. The holes at first should not exceed three-quarters of an inch, and the slope upwards should be so much that the sap will run freely in frosty weather, and not, by a slow motion, be liable to freeze in the mouth of the orifice. When the flow of sap begins to slacken, the holes may be increased to the depth of two and a half inches, or the depth of the sap or whitewood, and with an auger a quarter larger than was first used. The spout should not enter the hole more than half an inch; as the farther it enters, the more the running sap is obstructed. In ordinary seasons, the best time for making maple sugar, is the last twelve days in March and the first twelve days in April. It must freeze at night and thaw in the day to constitute good sap weather. A west wind is most favorable.

The next object is, to preserve the sap clean, and to do this, it is necessary to have clean vessels for its reception. The old way was to use troughs roughly cut from timber previously split through the centre. These answered tolerably well the first year. But being suffered to remain under the trees, they were often found when wanted the next year, filled with leaves, ice and filth, which unavoidably mingled with the sap. The best vessels for this purpose are wooden buckets, made broader at the top than at bottom, that they may be packed away in nests under cover, when the sugar season is over, and thus preserved clean. We have seen them sold at $8 per hundred. They will last many years.

It is found beneficial to put into each half barrel of sap a spoonful of slaked lime. This causes the impurities to rise better when boiling, which should be carefully skimmed off. The sap should be boiled before fermentation commences, which will happen, as the weather becomes warm, the second or third day. The greater the exposure of the surface to the atmosphere, when boiling, the greater will be the evaporation. When the sap has been reduced to syrup, it should be strained through a woollen or hair cloth, and then stand a few hours to settle; after which it should be turned carefully off from the sediment which has settled at the bottom. In *boiling down*, charcoal is the best fuel to use; for although the heat should be pretty brisk, it should be equable, and be confined to the bottom of the kettle. The *clarifying materials* should be added at the commencement of this process. These are generally milk, eggs, or what is better, calves' blood. The scum which rises should be carefully taken off. The impurities attach to these mucilaginous materials, and are carried with them to the surface.

When the syrup is sufficiently reduced, and taken from the fire, it should be stirred well for some time, in order to give it *grain*. This is effected by bringing every part of the mass in contact with the atmosphere; for if turned into moulds immediately, and not stirred, it will not be grained, but resemble candy rather than sugar. If intended to be caked, it must be turned into moulds before cold. Under the best process there will be a portion which will not granulate, on account of the vegetable mucilage which it contains, but which will drain off if the cask in which the sugar is deposited has holes at its bottom through which it can pass. To prevent the sap or syrup rising, a piece of fat may be thrown in, or the inner rim of the kettle rubbed with a piece of fat pork.

Molasses and vinegar are generally made from the last runnings, as the sap is then less adapted for sugar, abounding more in mucilage as the buds of the tree swell and being more liable to ferment. The molasses, when properly clarified, is superior to that from the sugar cane, having a peculiarly grateful flavor. The vinegar, though excellent for ordinary use, is not so well adapted for pickles as that made from cider.

Claying or whitening the sugar.—To promote the molasses passing more freely from the sugar, when draining in the moulds or tubs, and to improve its color, in two or three days after the moulds or tubs are unstopped at the bottom, mix white clay with water so as to reduce it to a thin mortar; with this cover the top of the sugar one inch and a half thick: when the covering appears dry, remove it, and supply the place with a fresh covering about two inches thick. This process may reduce the sugar one-fifth, but will add correspondingly to the molasses.

The Roller is in many ways serviceable on a farm, and it is an implement which every farmer, with trifling aid from the smith, may shift to make for himself. It may consist of a log of two or three feet in diameter, and eight or ten feet long, nicely smoothed on the outside, with gudgeons in the centres of the ends, a frame, and tongue and shafts to draw and guide it by. After sowing small grains and grasses, the roller should follow the harrow. It breaks down the clods, smooths the surface, and presses the earth to the seed, and thereby causes more of it to vegetate and grow than otherwise would; for if the earth does not come in close contact with the seed, it remains dry, and is lost. In the spring, as soon as the fields are dry and firm enough to resist the feet of the cattle, the roller is very beneficially applied to meadows and winter grain. At this time the surface of tilled ground is crusted, and generally checked with small fissures, which expose the collar (the part which connects the roots and leaves,) and roots to the drying influence of the sun and winds. The roller breaks and pulverizes the crust, and renders the soil more pervious to heat, and closes the fissures. It is also serviceable in partially covering the crowns of the plants, which induces them to send out new roots and to send up more seed stalks. This effect is particularly noticeable in barley, when the roller is passed over it, after it has become three or four inches high. If winter grain is harrowed in the spring, the roller may follow the harrow.

In rolling grass lands it is necessary to attend in a particular manner to the season, as it cannot be performed to advantage when the surface is either in a too dry or too wet a condition: if too wet, the ground will become poached by the cattle's hoofs; and if too dry, the roller will make little impression in levelling the surface; and it is generally necessary, if the roller be of wood, to add to its weight for grass grounds, by placing stones in the box, which is attached to it for that purpose.

Potatoes.—The object of farmers generally is, to plant those varieties which will give the greatest yield, without regard to flavor or nutritious properties. This is wrong. Potatoes differ one-half in the nourishment they afford to domestic animals, as well as to man; and the eating of a *good* thing, may be as grateful to the brute as to the man. It has been ascertained by chemical tests, that one hundred parts of a good potato contain twenty-eight per cent, or twenty-eight parts, of nutritious matter, and that one hundred parts of some poor varieties contain not more than fourteen parts of nutritious matter. The man or the brute, therefore, that eats 100 lbs. of poor potatoes, swallows 86 lbs. of water and ligneous matter which does not contribute in the least to nourish the body, nor to promote health. If the crop is to be consumed in the family, or on the farm, there is a propriety, on the score of economy, in selecting good sorts, though these do not yield more than half as many bushels as the poor sorts do. But the difference in product, seldom, if ever, exceeds a quarter. For market, the difference between good and bad potatoes is, or ought to be, a quarter; and it will be, when the buyer knows how to appreciate and to distinguish the difference. The best varieties of potatoes now in vogue, are the kidneys, or foxites, the pink-eyes, the Mercers, and the Sault St. Marie.

The potato requires, with us, a rich, moist and cool soil; that part at least in which the tubers form to be loose, that the stolens may penetrate, and the potatoes swell, without much obstruction. A clover ley, and long manure, are particularly beneficial to the crop. They should not be planted so close that the tops shall exclude the sun from the soil. Three feet in drills, or two and a half in hills, is near enough for ordinary varieties. Nor is it beneficial to earth them after the tubers have began to form, as this removes the roots too far from the surface, and causes a new set of stolens to issue.

Stolens are the roots on which the potatoes form, and are distinct from those which penetrate deep, and supply food to the plant. But all weeds should be carefully destroyed; as one of these if suffered to ripen its seed, takes as much nourishment and moisture from the ground as a stem of the potatoes. This crop should not be planted twice on the same ground in succession, as the second year the product will be greatly diminished.

Grafting is a mode of propagating varieties of fruit of esteemed quality. Grafts may be cut any time after the fall of the leaf in autumn, and before the buds begin to swell in the spring. They should be of the preceeding year's growth, are best from bearing trees and exterior limbs. They may be preserved by embedding their larger ends in clay, a potato, or in moist earth, in a cellar in winter, or in the open ground, partially or wholly covered, in the spring. Grafts are annually sent across the Atlantic. The great care should be that they are not kept too warm or too moist, so that the buds swell before they are wanted for use. The rationale of grafting will suggest the time and the manner in which it should be done. The scion and graft are to be so adjusted that the sap wood of the stock, by which the sap ascends from the root, comes in contact with the sap wood of the scion; and a like adjustment must be observed between the inner bark of both, through which the sap descends from the graft to the stock after it has been elaborated in the leaves. Without the first precaution, the sap will not reach the graft, which will consequently shrivel and die. Without the last, the graft cannot knit or unite to the stock: for it is the descending sap which forms the new wood, and which indeed causes the graft to send its roots down into the earth, upon the outside of the wood, but under the bark of the stock. The union can only take place after the sap has begun to circulate in the stock, which is when the buds are bursting. The clay or composition is applied to exclude the drying influence of the air and sun, and also rain, from the wound until a complete union has taken place. The graft does not become injured by being somewhat shrivelled before it is inserted; but if it appears too much so, it may be buried a few hours in moist earth before it is used. The compositions used as substitutes for clay are many. A good one is one part tallow, two parts beeswax, and four parts rosin, melted and incorporated like shoemaker's wax. If the weather is cold, this will require to be softened by immersing it a time in warm water. A thin layer of this, covering the end of the stock, and the slit, will suffice. With the addition of a little more tallow, the composition may be spread upon linen or cotton cloth, when warm, and the cloth cut to the required size for a graft, and applied with less trouble in the form of a prepared plaster. The different processes of grafting are so generally known that we need not detail them; our object being only to throw out such suggestions as may tend to render the success of the operation more certain.

Canada Thistles.—Of all the expedients which we have seen recommended to destroy this troublesome and prolific plant, a writer in the Genesee Farmer recommends a mode entitled to a preference; because he has, in successive years, found it to be efficient in practice—and because the result is in perfect consonance with the laws of vegetation. The method is, to plough and plant the field where they have obtained a footing with corn, and to go over the field twice a week, as soon as the thistles appear, and carefully cut every one with a hoe, as far under the suface as practicable. In August, says the writer, they began to become thin and scattering, and appeared of a sickly yellowish hue. The operation was continued till October. In September, the roots were found, on examination, in a state of decay, and of a blackish color. The whole were destroyed. Leaves are as necessary to the growth and being of a plant as lungs are to an animal. Plants cannot grow without the agency of leaves; for it is in these that the food of the vegetable is elaborated and fitted for its wants. Trees are often killed by caterpillars that destroy the leaves, when the sap is in free circulation, and the plant most in need of their active offices. The ascending sap becomes stagnant, ferments, and destroys the vitality of the plant. Thus with the thistles, by constantly destroying the leaves, before they elaborate the food collected by the roots, although very tenacious of life, the roots die for want of nourishment. Where the thistles are confined to a small patch, a pile of manure left on them a few weeks will effectually destroy them, as will any other covering which excludes the light and air wholly from the leaves.

Chemistry in the Kitchen.—Why is it necessary to mix lime with ashes in soap making? The answer to this question will explain the reason why the process often fails, and suggest a remedy for the evil. Common soap is a compound chemically united, of alkali, or ley from potash, and grease, fat or tallow. The alkali is naturally combined with carbonic acid, for which it has a stronger affinity than it has for grease; hence while it continues united with the acid, it will not unite with the grease, and produce soap. But lime having a stronger affinity for the acid than the alkali has, extracts it from the ley, and the alkali then readily unites with the grease, and forms soap. From this it will be seen, that the lime should be spread over the bottom of the leech tub in order that the ley may filter through it; and also that the lime be fresh burnt, as it then has a greater capacity for the acid.

The Swine, in many parts of our state, are of a bad breed, with long legs and snouts, and sharp back, of a roaming propensity, and slow and expensive to fatten. The method of improving, where a good breed cannot be readily procured, is pointed out in the directions for improving farm stock, under the head of the Science of Agriculture, an article which we particularly recommend to the perusal of our farmers.

Have you planted a Vine?—If you have planted one that produces good fruit, take care of it, and propagate it by cuttings and layers, and its fruit will richly repay your labor. If you have not, buy or beg one, and plant in the present spring. If you buy, it will cost you two or three shillings; if you beg one, I don't know how much it will cost you to requite the favor. The second year after planting it will produce you fruit, which will every year increase as the plant enlarges. The fruit will be found to be wholesome and grateful, and you will realize the pleasure of *sitting under your own vine*, during the intense heat of summer; and you will wonder that you have lived so long without enjoying this pleasure. The native kinds most worthy of cultivation, are the Isabella, Winne and Catawba, all hardy, thrifty and abundant bearers, and their fruit ripening in the order in which they are named. If you want foreign fruit, the Sweet-water, Chasselas, black cluster, and other early kinds are to be preferred. These demand more care than the native kinds, and the vines will require a slight covering of earth during the winter. A little experience will make you familiar with their management, and convert the labor required for their care into a recreation.

Rearing Calves.—The following is the general method of rearing calves in Britain, and differs not materially from that followed by Bakewell, the great cattle breeder:

"The calves sucked for a week or fortnight, according to their strength: new milk in a pail was then given a few meals: next new milk and skim milk mixed, a few meals more; then skim milk alone, or porridge made with milk, water, ground oats, &c. and sometimes oil cake, until cheese making commenced, if it was a dairy farm; after which, whey porridge, or sweet whey, in the field, being careful to house them in the night, until the warm weather was confirmed. Bull calves and high bred heifers, however, were suffered to remain at the tile until they were six, nine, or perhaps twelve months old, letting them run with their dams, or more frequently less valuable cows or heifers."

It is to be remarked that they have no Indian meal in Britain. This is substituted with us, for oat meal, and even oil-cake. A handful put into skim milk or whey, for calves, improves their condition greatly.

Massachusetts Premium Crops.—Among the premiums recently awarded by the Massachusetts Agricultural Society, were the following:

To E. H. Derby, of Salem, for the best crop of turnips. Product on two acres one quarter and seven poles, 1,730¼ bushels. Seed sown with drill barrow.

To Payson Williams, of Fitchburgh, for spring wheat, on one acre. Product 55 bushels three pecks. Seed sown, 2¼ bushels. Variety from Black Sea.

To William Carter of Fitchburgh, for potatoes. Product 677 bushels on an acre. Seed 55 bushels, long reds and blues.

To the same, for barley. Product on one acre, 55 bushels. Seed 5 bushels, of the two rowed kind.

Memorandum.—February 20. No snow. Thermometer 55 degrees in shade. Blue birds appear. Sowed spring wheat and garden peas.

Plaster.—It is a practice with some farmers, and we venture to recommend it to all, to sow plaster of Paris on their grass grounds *in March.*

To destroy the Weevil in grain.—Soak linen cloths in water, wring them, and cover your grain with them: in two hours time you will find all the weevils upon the cloth, which must be carefully gathered off, that none of the insects may escape, and then immersed in water to destroy them.—*Dom. Ency.*

ADDRESS OF THE PRESIDENT,

Delivered before the New-York State Agricultural Society, at the Annual Meeting, February 12, 1834.

We have associated, gentlemen, to increase the pleasures and profits of rural labor—to enlarge the sphere of useful knowledge—and, by concentrating our energies, to give to them greater effect in advancing the public good. In no country does the agricultural bear so great a proportion to the whole population as in this. In England, one-third of the inhabitants only are employed in husbandry; In France, two-thirds; in Italy, a little more than three-fourths* —while, in the United States, the agricultural portion probably exceeds five-sixths. And in no country does the agricultural population exercise such a controlling political power, contribute so much to the wealth, or tend so strongly to give an impress to the character of a nation, as in the United States. Hence it may be truly said of us, that our agriculture is our nursing mother, which nurtures, and gives growth, and wealth, and character to our country. It may be regarded as the great wheel which moves all the machinery of society, and that whatever gives to this a new impulse or energy, communicates a corresponding impetus to the thousand minor wheels of interest which it propels and regulates. Knowing no party, and confined to no sect, its benefits and its blessings, like the dews of Heaven, fall upon all. Identified, then, as agriculture is, with the interests of every department in society, it becomes *our* profession, in particular, to endeavor to enlighten its labors, to remedy its defects, and to accelerate its improvement.

Of the multitude of objects which present themselves as worthy of our consideration, I can only embrace a few of the most prominent ones in the subject matter of this address. I shall particularly invite your attention to

The economy and application of manures;
The improvement of farm implements and machines;
The advantages of draining;
The defects which exist in the present mode of managing our hop and barley crops;
The division of labor;
The introduction of new articles of culture; and
To some illustration of the comparative profits of good and bad husbandry.

Manures.—If we consider that all animal and vegetable substances are susceptible of being converted into manure, or food for farm crops, and reflect upon the great quantity of these which are wasted upon a farm; and if we add to these considerations the fact, now well established by chemical experiment, that yard dung loses a large portion of its fertilizing properties, in the gases which escape, where fermentation is suffered to exhaust its powers upon it in a mass, we may be able to appreciate, in some measure, the great defects which exist in our general management of this all-important material.—Manures are a principal source of fertility. They are to our crops what hay and forage are to our cattle—the food which is to nourish and perfect their growth. Continual cropping, without manure, as certainly exhausts land of its fertility, as constant draining from a cistern that is never replenished exhausts the water which it contains. The practice of some, who, disregarding one of the soundest rules of farming, continue to crop without manuring, till the soil will no longer yield a return to pay for the labor, is upon a par with that of the man who undertook to teach his horse to live without food: just as the experiment was about to succeed, the horse died. A considerable portion of the lands in Virginia and Maryland, which were originally fertile, have in this way been judiciously exhausted, and thrown into commons as not worth enclosing. I lately received a letter from a young gentleman in the former state, soliciting my advice as to the means best adapted to restore fertility to two worn out farms, which had recently come into his possession, and which he stated, would no longer produce clover. It is much easier to prevent sterility than to cure it, on the same principle that it is easier to *keep* a cow in flesh when she is so than to *restore* her to flesh after she has become wretchedly lean. In some soils, to which nature has been uncommonly bountiful in imparting the means of fertility, as in many of our river alluvions, the deterioration is slow and imperceptible; yet it nevertheless goes on even there. But in ordinary, and particularly in the lighter soils, the profits of husbandry depend, in an eminent degree, upon the faithful application of all the manure which a farm can be made to produce.

In regard to the question,—in what condition are manures most economically applied?—I am sensible that a difference of opinion exists, many contending, even on philosophical grounds, that it is most wise to apply them after they have undergone fermentation. If the question was merely, whether a load of fermented or unfermented dung is of the greatest intrinsic value, in ordinary cases the former would be entitled to the preference, because it contains the greatest quantity of vegetable food. But the correct way to state the question would be this: Will *five* loads of rotted manure impart greater fertility than *ten* loads that are unrotted? The numbers ought rather to be five and fifteen—for I think common dung suffers a dimunition of two-thirds, instead of one half, in volume, by a thorough process of rotting.* It will assist in determining the question, if we ascertain what the manure parts with during fermentation, for it evidently loses much in weight as well as in bulk, and whether this lost matter would, if buried in the soil, have afforded food to the crop. For if it possessed no fertilizing property, the sooner it is got rid of the better, and we save the expense of transporting it to the field. But if it really consists of prepared or digested food, fitted for the organs and wants of plants, it is truly improvident to have it wasted and lost for all useful purposes. The latter is really the case.† The matter which escapes in fermentation is vegetable matter in a gaseous form, fitted by natural process, like chyle in the animal stomach, to enter into and become a constituent in a new generation of plants. It is principally carbonic acid gas, the aliment of vegetables and the true staff of vegetable life. It has been vegetable matter, and will become vegetable matter again. Without resorting to chemical proofs or authorities to prove this, I will suggest a mode by which the matter can be satisfactorily settled. Let any farmer, in the spring, before yard manure ferments, put twenty-five loads in a pile to rot, and take another twenty-five loads to the field where he intends to plant his corn, spread it upon one acre, plough it well under, harrow the ground, and plant his seed. Let him plant another acre of corn along side this, *without manure.* As soon as the corn is harvested, carry on and spread the twenty-five loads of prepared or rotted manure left in the yard, or what remains of it, upon the acre not manured for corn, and sow both pieces to wheat. Unless my observation and practice have deceived me, he will find the result of the experiment to be this:—the acre dressed with long manure will yield the most wheat, because the manure has been less exhausted in the process of summer rotting, and for the reason, that in cultivating the corn, it has become better incorporated with the soil—*and it will, besides, have increased the corn crop some twenty or thirty bushels, in consequence of the gases upon which the crop here fed and thrived,* but which in the yard were dissipated by the winds and lost.

Plants, like animals, require different modifications of food. In general, the plants which afford large stocks or roots, as corn, potatoes, turnips and clover, thrive best on the gases which are given off from dung in the process of fermentation—while those exclusively

* Babbage on the Economy of Machinery.

* During the violent fermentation which is necessary for reducing farm-yard manure to the state in which it is called *short muck*, not only a large quantity of fluid, but of gaseous matter is lost; so much so that the dung is reduced one-half or two-thirds in weight, and the principle elastic matter disengaged is carbonic acid, with some ammonia; and both these, if retained by the moisture in the soil, as has been stated before, are capable of becoming a useful nourishment for plants.—*Davy.*

† As soon as dung begins to decompose or rot, it throws off its volatile parts, which are the most valuable and most efficient. Dung which has fermented so as to become a mere soft cohesive mass, has generally lost from one-third to one-half of its most useful constituent elements. It evidently should be applied as soon as fermentation begins, that it may exert its full action upon the plant, and lose none of its nutritive powers.—*Davy.*

cultivated for their seeds, as wheat, barley, &c. are often prejudiced by these volatile parts, which cause a rank growth of straw, without improving the seed. Hence the first mentioned crops may be fed on long manure without lessening its value for the second class, provided they immediately follow, and hence unfermented manures are most economically applied to hoed crops.

Different rules should govern in the application of fermented and unfermented manures. The latter should be buried at the bottom of the furrow with the plough, the former only superficially with the harrow. The reasons are these—unfermented dung operates mechanically while undergoing fermentation, in rendering the recumbent soil porous and pervious to heat and air the great agents of decomposition and nutrition, and the gaseous or volatile parts being specifically lighter than atmospheric air, *ascend*,* and supply the wants of the young roots. The next ploughing turns the residue of the dung to the surface, when it benefits on a different principle; for fermented manures consist of ponderable substances, which have a tendency only to *descend*.

Manures possess a high value in a good farming districts, where the natural fertility of the soil has been impaired by culture. In most of our large towns, it is bought up at one to two dollars a cord, and transported ten or twenty miles by land carriage, and much farther by water. So essential is it considered in Europe to profitable husbandry, that every material which imparts fertility is sedulously economised, and applied to the soil. Among other things, ship loads of bones are annually brought from the continent into Great Britain, and ground for manure. Bone dust is in such high demand in Scotch husbandry, that its price has advanced to 3s. 6*d*. sterling per bushel.

We possess no certain data to ascertain the saving which may be introduced into this branch of farm economy; yet if we put down the number of farms in the state at one-tenth of our population or 200,000, and estimate that an average increase of five loads upon each farm might annually be made, it will give us a total of one million loads, which, at the very moderate price of 25 cents, would amount to $250,000 per annum.

Farm implements.—We must all have noticed the great improvements which a few years have made in the mechanic and manufacturing arts. Scarcely a process is managed as it was 20 years ago. Scarcely an old machine but has undergone improvements, or given place to a better model. Manufacturing operations have been simplified and abridged, and human labor has been reduced to a comparative cypher, by the substitution of machinery and the power of steam. The effect has been a great reduction in the price of manufactured commodities, and an increase in their consumption. We are assured that during the twelve years which elapsed between 1818 and 1830, Sheffield wares—hardware and cutlery—experienced an average reduction in price of sixty per cent, varying upon different articles from forty to eighty-five per cent.† Cotton goods, books, and various other fabrics, have undergone a reduction no less remarkable within our time. These beneficial changes have resulted in a great measure from the aid which science has either itself imparted, or which it has elicited from mechanic skill—for a useful invention often awakens latent genius, and calls forth successful competition, even in the unlearned. No sooner is an improvement in the manufacturing arts announced, than it is adopted whenever it can be rendered beneficial—such is the facility of intercourse—such the desire—the necessity—*there*, of profiting from every discovery which benefits their art. The farmer is less able and less willing to keep pace with the march of intellect. He has few opportunities of becoming acquainted with the improvements of others, except by slow degrees; and he is so liable to be taken in by the catch-penny productions of the day, and is, withal, so distrustful of new experiments, that he will hardly venture to buy new implements and machines, nor to adopt new practices, however beneficial they might prove on trial. Mr. Coke tells us that his examples in farming, (and few men ever gave better,) only enlarged the circle of their influence about a mile in a year. Hence, as regards this branch of improvement, we have much to do ere we can overtake the spirit of the age, as exemplified in our sister arts.

Many of our farm implements have undergone improvement; yet there are others which have been either but partially introduced, or are hardly known, that are calculated to abridge labor and to increase the profits of the farm. There exists a great disparity in the quality of implements. In ploughs, for instance, there is a difference which eludes superficial observation, particularly in regard to the force required to propel them that is worth regarding. I have seen this difference, in what have been termed good ploughs, amount to nearly fifty per cent, or one-half. The perfection of our implements is intimately connected with a correct application of mechanical science, a branch of knowledge hitherto too little cultivated among us. Mr. Many, the enterprising proprietor of an iron foundry in this city, has assured me that there are more than two hundred patterns of ploughs now in use in this state. Of this number some may be very good, but many must be comparatively bad. But what individual is able to decide upon their relative merits, or even to become acquainted with the different sorts? It would be rendering an important service to the state at large, and especially to the farming interests, if a competent board was appointed, comprising men of practical and scientific knowledge to test thoroughly, by examination and perfectly satisfactory trial, not only the ploughs, but the other implements of husbandry now in use, or which may be hereafter invented, and to publish the result of their examination, and certify their intrinsic and relative merits. Such board might meet once or twice in a year, and no inventor or vender who had confidence in the goodness of his machine would fail to repair to the place of trial. This would tend to call into action mechanical science and skill, in the confidence of receiving a just reward; the public would confide in the trial and opinions of the board; good implements would be extensiveiy introduced, and bad ones would be discarded. The expense of the examination would bear no proportion to the public benefit.

Draining.—Few expenditures in husbandry are calculated to make better returns than those made in draining, a branch of labor which has had a very limited practice among us, and of which we have yet much to learn. Many of our best lands are permitted to remain in a comparative unproductive state, on account of the water which saturates the surface, or reposes on the subsoil. To render these lands productive, even for arable purposes, it is only necessary, by well conducted and sufficient drains, to collect and carry off the surplus water which falls upon the surface, or rises from springs below. The rationale of draining is briefly this:—Air and heat are essential agents in preparing the food of plants which is deposited in the soil, and they are also necessary for the healthful development of most of the cultivated varieties. These agents are in a measure excluded from the soil by the water. The temperature of a soil, habitually saturated with spring water from beneath the surface, seldom exceeds 55 or 60 degrees at midsummer. Hence the grains and grasses, which require a heat of 80 or 90 degrees to bring them to a high state of excellence, can never thrive in these cold situations, where they find neither the warmth nor the food suited to their habits. But drain these soils, and they become light and porous, pervious to solar and atmospheric influence, the process of vegetable decomposition is accelerated, and a high state of fertility is developed.

One of the modern improvements in draining, which tends very much to give permanency to the work, is to dig the trench with a spade adapted to the purpose, with a wedge shaped bottom, say three inches at the bottom and five inches at the upper surface of the lower cut, and to fill this part with *broken* stone. The trench is dug two feet deep before this cut is made, and the wedge shaped bottom cleaned with a scraper fitted for the purpose. By concentrating the water, it acquires force, and keep the passage open. And if broken stone is employed, not exceeding three inches in diameter, it affords no harbor for ground mice or moles, which otherwise get in and open passages to the surface, through which water and earth are apt to enter and choke up the drain. Drains of this description are very efficient and economical to keep the bed of a road dry, placed either at it sides or in the centre, having a fall to carry off the water. A cubic yard of stone will lay about 120 feet of under drain of the dimensions above given, and eight inches deep. The breaking of the stone will cost three or four shillings the cubic yard.

The acknowledged utility of irrigation, or of spreading, occasionally, the water from streams or the highways over lands, has led to

* A friend made this experiment: He trenched a quarter of his garden, and deposited a layer of *dry straw*, three inches thick, one foot below the surface, as the only manure, and planted it with water-melons. The crop, he said was the finest he ever grew. On examining the straw in autumn, he found it was completely rotted, and reduced to the condition of short muck. He was satisfied that his melons had been highly benefitted by the straw while undergoing fermentation, and that, had the straw rotted in the yard, the volatile portions of the manure would have been wholly lost.

† Babbage on the Economy of Machinery.

a misapprehension with many of the principles of draining. Irrigation is employed to furnish water to soils, generally slopes, where it is deficient, and from whence it speedily passes off, or to cover grounds in winter to exclude severe frosts. The water thus employed is nearly of the warmth of the atmosphere, and is generally charged with fertilizing properties. Draining is employed upon flat surfaces, or upon slopes abounding in springs, where there is an excess of water, and of a temperature which materially chills and deadens the soil. Irrigation supplies water where there is a deficiency—draining carries it off where there is an excess. Both are intended, by opposite modes, to produce the same result—a suitable degree of moisture for the wants of the crop.

We have illustrations in abundance of the advantages of draining; and so apparent have been its benefits, in districts where it had a fair trial, that a knowledge of the science, for a science it may be called, is considered an important branch of agricultural knowledge. Upon one estate in Scotland, where the farmers are generally tenants, sixty-five miles of under drains have been made within a few years, at the joint expense of the landlord and tenant. The benefits of this expenditure have been—to the landlord, an additional 5s. per acre upon his annual rental—and to the tenants, a more than corresponding advantage in the increase of their crops. A gentleman who deservedly ranks high in this society,* and who has been a pioneer in this branch of improvement, has assured me, in answer to my inquiries, that he has applied under draining to twenty different fields, to the extent of more than two thousands rods, at the average cost of fifty cents per rod; and that he has been fully remunerated for the outlay in every instance, in the increased products of three years. In some cases, he adds, where the lands produced coarse grass of little value, and where tillage was out of the question, he has expended twenty dollars per acre in under draining, and now grows upon these lands Indian corn, oats, wheat and clover, luxuriantly. The value of this land has been increased from 20 to 100 dollars per acre, or 500 per cent, by the operation of draining. I have had some personal experience in this sort of improvement, and have made it the subject of calculation, and am induced to believe that where stone is convenient, efficient and *permanent* under drains may be made as low, if not lower, than what they cost my friend A laborer accustomed to the work averaged ten rods per day upon my farm, for thirty days. The ground was sandy and soft. Other materials were substituted for stone, which would, had they been employed, have required more labor, though they had been prepared to his hands.

The benefits of under drains are not limited to lands which show water upon the surface. We may often notice at midsummer, that some flat lands have a sterile and compact appearance, whose general aspect would indicate fertility. This is readily accounted for by supposing what is often known to be the fact, that the soil reposes upon a compact strata which prevents the descent of water, and which has not sufficient inclination to pass it off. This water chills the ground, retards the decomposition of vegetable food, and causes comparative infertility. This may be effectually remedied by parallel under drains, the space between them to depend upon the compactness of the soil, a drain being supposed to collect the water nine or ten feet on each side in the most tenacious ground. It is usual, where fields are thus drained, to make a cross drain along the upper side, and also one along the lower side, to receive and carry off the water which the parallel drains collect from the soil.

Barley and Hops are becoming important staples of our state, particularly of the northern and western portions. Few persons, I presume, have a just conception of the quantity which we annually produce, or the immense loss we sustain for want of better knowledge, and more care in cultivating and preparing these crops for market. Our soil and climate are found to be well adapted to their growth, and we have produced as fine samples of both as are grown in any part of the world. Independent of an increasing home consumption, the hop in particular is always in demand for exportation. If in good condition, it is one of the most profitable crops to the grower that can be raised. If in bad condition, it is often a losing concern, not even affording a return for the labor bestowed in its culture.

Deeming the subject one of deep interest to the community, and as coming particularly within the province of this society, I have been at some pains to collect data from the best sources in relation to the barley and hop trade, with a view of submitting an abstract of the facts to your consideration.

Two-thirds of all the barley grown in the United states is believed to be marketed at Albany and the neighboring towns upon the Hudson. The amount brought to our market last year, is estimated at 450,000 bushels. It is of two kinds—two rowed and six rowed, one possessing a thin and the other a thick skin, and larger berry, ill adapted to be malted together, as one kind malts quicker than the other, and becomes sensibly deteriorated before the saccharine matter of the other kind is fully developed. The two varieties are often mixed by the grower; but that which passes through second hands, as the merchant, boatman, &c. is almost universally so, and is besides frequently adulterated with oats and other foreign matters, which seriously depreciate its value. It is stated that the deterioration and loss consequent upon the bad condition of the barley brought to market the last season, was equal to ten per cent, or 45,000 bushels—which, expressed in money, at 75 cents the bushel, amounts to $33,750.

Serious as our loss seems to be from the bad management of our barley, it will be found to be no less so upon our hop crop. About 2,300 bales, or 50,000 pounds, is the estimated quantity brought to market the last year. Of this quantity, I am assured by the best judges of the article, there were not 200 bales which ought to have been denominated *first sorts*. Many of the hops were imperfectly dried, and in consequence of the moisture in them when bagged, a fermentation was induced highly detrimental to their quality. The criterion by which hops are determined to be well dried is, when the stocks become perfectly shrivelled and dry. This is not found to be the case with those sent to this market, and the effect is, that deterioration goes on till the hops are used; whereas well dried hops lose very little of their goodness by being kept over. Again—too much heat, particularly in the outset, is prejudicial, as it drives off with the moisture the aroma or essential oil which gives value to the hop. A great portion of our hops are picked too early, before they are sufficiently matured, while other parcels are scorched or otherwise injured in the process of curing; and although they might bear a superficial appearance of being prime, most of them, on critical examination, were found to be extremely deficient in the principle which gives them value. While the average price may be stated at 18 cents, many of these hops are declared not to have been worth two cents the pound.

Here then—if the data which I have given are correct—are two of the staple productions of our soil, on which we have lost, or what amounts to the same thing, have failed to realize, from 50 to 100,000 dollars in a single year, *from carelessness, or a want of knowledge in their culture and preparation for market.* To what extent might this sum be swelled, were we to embrace in this inquiry, the other products and labors of husbandry! A like disparity, I apprehend, between good and bad management would be found to exist in almost every department of our agriculture.

Division of Labor, although not so well adapted to farm labor as it is to the mechanic and manufacturing arts, is nevertheless susceptible of being advantageously studied and applied by the husbandman. The process of pin making is subdivided into seven branches, to each of which is assigned a distinct set of hands. The advantages which result from this arrangement may be appreciated when I state, that where the workmen who whiten the pins to perform all the different processes, they would cost in making "three times and three-quarters as much as they now do by the application of the division of labor."* This principle is extensively adopted in manufactures, and is no inconsiderable cause of the reduction of price of their fabrics. It has been advantageously introduced in the farming of Great Britain. Men are kept as much as possible to the same branch of labor, because by becoming familiar with it, they perform more and do it better, as a great individual responsibility rests upon them. All light work is performed by women and children. A man who can earn six shillings should not be employed on what a boy can do equally well, who is paid two shillings per day. Say a farm affords one hundred days of this kind of labor in a year—the gain to the cultivator, by employing the boy instead of the man will amount to fifty dollars.

New articles of Culture.—Forty years ago cotton was hardly recognized as an article of culture in the United States. In 1832, it constituted by far our greatest material of export, the quantity ex-

* The late H. W. Delavan, Esq.

* Babbage on the Economy of Machinery.

ceeding three hundred and twenty-two millions of pounds, and the estimated value falling but a fraction short of thirty-two millions of dollars. In addition to this, the home manufacture of the raw material now gives employment to half a million of our population, while the goods fabricated from it constitute a material source of our internal commerce. Who can pretend to say what will be the great staples of our country forty years hence? Almost every discovery in science calls into existence a new art, and almost every new art furnishes a new demand for some product of the soil. It is the province of wisdom to keep pace with the knowledge of the times, that it may profit by its constant improvements. There is already an increasing demand for products of the soil, which we have the ability to supply, but which we continue to import from Europe. Madder, woad and weld are essential to our manufactures, and the quantity which is consumed, draws no inconsiderable amount annually from our country. Our soil and climate are adapted to their culture, and with a little enterprise and experience we may soon be able to supply the home demand. The madder now imported is computed to cost more than two millions of dollars per annum.

The turnip culture will yet become, as it has proved in Britain, the basis of a great improvement in our husbandry. Turnips are at the same time an ameliorating and a cleansing crop, and are admirably fitted to precede barley or wheat. But their chief value consists in the abundant product, and the adaptation of the crop to the wants of all descriptions of farm stock, at the time when succulent food is most wanted, and when it can be but scantily supplied from other crops. The Swedish variety has a decided preference. On lands adapted to their culture, 600 bushels, or twenty tons of roots from the acre may be stated as a moderate average crop. The greatest objection to their culture is the labor and expense of securing them for winter use; but this is far greater in imagination than in reality. On this I can speak from personal experience. A neighbor raised last year from five acres of land, three thousand bushels, which he has fed during the winter, and upon which he is now fattening more than one hundred wethers, besides oxen.

The raising of mulberry trees and the production of silk is another branch of rural labor yet new among us, which bids fair to become a source of individual and national wealth, and which this society can enlighten and promote. The experiments already made have shown, that while the business abstracts very little labor from the ordinary employments of the farm, it is susceptible of yielding a handsome income to the farmer. The early attention of this Society in distributing seeds of the mulberry, has done much towards introducing and extending this branch of labor. It is computed that that seed may have produced half a million of trees, and that this number may have been doubled by individual efforts in that time. A new species of the mulberry, (*morus multicaulis,*) has been introduced from the Phillippine Islands, through France, by M. Perrottet, which promises new advantages in the production of silk. The tree is as thrifty and as hardy and as easily propagated as the white mulberry, while the leaves being much larger, are far more easily gathered, and are said to be better adapted to the production of fine silk than the other species of this tree. The Asiatic mulberry was introduced into France in 1824, and in 1830, it bore seeds abundantly. I would beg leave to suggest that the corresponding secretary be instructed to procure seed of the morus multicaulis, with a view of its being distributed by this society.

The demand for silk fabrics is already great in the United States, and is likely to increase in a far greater ratio than our population. The importation of silks in 1832, amounted to ten million dollars. As an article of export, the raw material will be in demand for the European, and the manufactured fabrics for the South American market. France imports raw silk to the value of 30,000,000 francs, and in Great Britain, the annual importation of the article exceeds 120,000,000 dollars. Hence there is little danger of the market becoming overstocked.

The contrast in the profits of good and bad farming is worthy of a moment's notice, as few take the trouble to scan it with care. I have already alluded to the bad management of our hop crop. Had all the hops which were brought to this market the last year been equal in quality to the best, and such they probably might have been with better knowledge and more care in their management—some twenty or thirty thousand dollars might have been put in the pockets of the growers, which they failed to obtain. Let us examine what the difference is in the corn crop. I estimate the cost of cultivating and harvesting an acre of corn at fifteen dollars, and that a farmer will ordinarily plant four acres. His expense then will be sixty dollars. If the crop yields him thirty bushels an acre—and more falls short than goes over this quantity—and he sells the product at fifty cents the bushel, he will be remunerated for his labor, but get not a cent of profit. *Now, if instead of thirty, the acre was made to produce, by good management, eighty bushels, the four acres, at the assumed price, would pay for the labor and afford him a nett profit besides, of one hundred and thirty dollars.* Here then would be a difference, in one year, in the profits of four acres, of $130, all resulting from good and bad management. I beg leave here, as affording to my hands a happy illustration of the contrast I would exhibit, the *practice* of an individual who stands deservedly high as a practical farmer,* and as a gentleman of respectability and veracity. I will first show what his land DID produce; and then what it DOES produce. "The land I now till, (he observes,) *at first,* would not produce, on an average, more than fifteen or twenty bushels of corn, ten or fifteen bushels of wheat, barley, or rye, and from half a ton to one ton of hay." By good management, economizing manures, and a proper rotation of crops, he adds, "some of my fields *now yield* from eighty to one hundred bushels of corn, thirty-five to forty bushels of wheat, fifty to sixty of barley, and from two and a half, to three and a half tons of hay per acre, *and with less labor* (except in harvest) *than when I did not raise more than one-third or one quarter as much per acre as I do now.*" The same intelligence and industry, that have trebled or quadrupled the profits of this farm, will produce like results whenever they are diffused and brought into exercise.

I have thus adverted, gentlemen, to those defects in our husbandry, to which I proposed at this time to call your attention, and have endeavored to show their magnitude, and the importance of applying efficient remedies. I will now call your attention to some of the available means of placing our agriculture on a more respectable and productive basis. The means which I shall particularly commend to your notice, may be embraced under the following heads:

1. A school, to illustrate the principles of science upon which the labors of agriculture are based, and to teach the best models of practice.

2. A more general diffusion of useful knowledge, in a cheap form, accessible to the humblest condition in life.

3. Agricultural associations; and,

4. The bestowments of pecuniary rewards, as stimulants to enterprise and industry.

I need not stop to dwell upon the advantages which learning affords to agricultural labor. Science may be defined a study of the immutable laws of the Creator which govern and regulate mind and matter. The study of these laws, and their application to the wants and comforts of life, have for ages constituted one of the highest and most useful employments of man; and have contributed, more than any other human effort, to refine and elevate us above the grosser and degraded condition of savage life. The concentrated benefits of these labors are now proffered to our hands. The pleasures and the benefits which they impart, are held out as noble rewards to mental labor, in the same spirit that the blessings of health and competence are promised to him who "earns his bread by the sweat of the brow." Labor, mental or bodily, is the inseparable attendant of rational enjoyment. And is that knowledge to be contemned, which has done so much good to the world, and which has countless blessings yet in store for the human family? "In a *theological* view," says a late eminent writer,† "science is nothing else than a rational inquiry into the arrangements and operations of the Almighty, in order to trace the perfections therein displayed. And what, continues our author, are the truths which science has discovered? They may be regarded as so many rays of celestial light descending from the Great Source of Intelligence to illuminate the human mind in the knowledge of the Divine character and government, and to stimulate it to a still more vigorous exertion in similar investigations, just as the truths of revelation are so many emanations from the 'Father of Lights,' to enlighten the darkness, and to counteract the disorders of the *moral* world."

Our state may be compared to a great family, the members of which are employed in diversified pursuits, all designed and calculated to promote the common weal—having a common as well as individual object, and all united by reciprocal ties. In this light it is considered as respects crime and want. One is punished, and the

* Earl Stimson, of Galway.

† Dick on the Improvement of Society by the Diffusion of Knowledge.

other relieved, by common consent, and at the common charge. We have erected splendid and extensive establishments for the vicious and the poor. The county of Albany has been at greater expense for its poor than would be required of the state to establish and support a school of agriculture. Would it not evince both prudence and economy to endeavor to *prevent*, or to *lessen*, these growing evils in society, by devoting a portion of the common means to schools, which should teach the hands useful labor, and imbue the heart with the love of virtue? The adage teaches, that "an ounce of prevention is worth a pound of cure." If ignorance be one of the chief causes of vice, and indolence the parent of want; and if knowledge be one of the mainsprings of virtuous conduct, and competence the sure reward of industry—then the more knowledge is diffused, and the more that industry is encouraged, the less we shall be called upon to expend upon poor-houses and penitentiaries. It no longer admits of doubt, that knowledge and industry are the great conservators of public morals, as well as the great instruments of public wealth.

It has been remarked, that the more we provide for any one class, the more it will increase. This would seem to hold good in regard to the vicious propensities of our nature, and why not in regard to habits that are commendable and praiseworthy?

To speak practically. Our agriculture is greatly defective. It is susceptible of much improvement. How shall we effect this improvement? The old are *too old to learn*, or rather, to unlearn what have been the habits of their lives. The young cannot learn as they ought to learn, and as the public interests require, because we have no suitable school for their instruction. We have no place where they can learn the *principles* upon which the *practice* of agriculture is based—none where they can be instructed in all the modern improvements of the art. It is devoutly to be hoped, that our fathers in council, justly appreciating the importance of the subject, will add another to the proud trophies which New-York has already won in the noble march of improvement, by properly responding to the correct views of this subject expressed in the message of our chief magistrate.

Our periodical publications, devoted to the interests of the agricultural and mechanical classes, have proved highly beneficial, and are daily enlarging the sphere of their influence. These benefits, however, may be greatly multiplied by a cheap work, adapted to the means of persons in humble circumstances, and to the economy of those who are able but unwilling to expend two or three dollars a year for an agricultural paper. It is believed there are more than 200,000 farmers in the state who read little or nothing calculated to improve their knowledge in the business by which they live. With the view of bringing the subject before the society, I have made inquiries as to the price at which a respectable publication of this character can be printed. The estimates have been predicated upon the supposition, that the editorial labors will be gratuitous—that the subscriptions will uniformly be paid in advance—that arrangements will be made to give it an extensive circulation, and that an edition of at least ten thousand copies will be disposed of. The result of my inquiries is, that a monthly publication, of sixteen quarto pages to each number, making one hundred and ninety-two pages in a year, can be furnished in parcels of twenty or more, at twenty-five (50) cents per annum. The postage to any place within the state will swell the cost to the subscriber to thirty-seven and a half (62½) cents per annum. An amount so trivial, as to win indifference, and to silence the objections of avarice. I submit to you, gentlemen, whether a more efficient mode of furthering one of the objects of our association—the diffusion of useful knowledge—can be devised, than the one here presented. Through the liberality of two public spirited and highly respected gentlemen,* a specimen sheet of the proposed publication has been published, and has been submitted for public examination. Under the auspices of this society, the CULTIVATOR may be rendered a vehicle of useful knowledge, and a means of effecting great public good. I commend it to your guardian care.

In referring to *agricultural associations*, as a means of improvement, I think I shall be sustained by the opinions of those present, as well as by the authority of past experience, in the little I have to say. These associations tend to promote social and friendly intercourse, and an interchange of kind offices; to make our farmers emulous of excelling in their cattle, in their crops, their buildings and in the neatness and order of their domestic arrangements; they bring them acquainted with each other's improvements and means of economising labor; instruct them in the comparative value of breeds of animals and the relative value of crops. They promote industry, frugality, and the love of knowledge. They tend to multiply our comforts and increase our wealth, by the laudable emulation they call into action, and to enlighten and embellish our country.

And yet I am sensible that those associations find but comparatively few ardent advocates among our farmers. Many are indifferent because they do not appreciate their benefits, or from an apathy, common to our nature, in every measure which does not promise present gain. Some will not support them, lest they should lose a day or a dollar. And others oppose them from an envious wish to deprive their neighbors of that public commendation which they are conscious they do not themselves deserve, and are not likely to obtain. The man who thinks and acts only for *self*, regardless of the welfare of those around him, and who fancies that he rises because others sink, mistakes alike his interest and his duty, and is a stranger to those ennobling feelings which flow from disinterested acts of benevolence and philanthropy. If the comparison may be tolerated, I would liken the selfish man to the moon, whose sombre rays impart no vivifying influence upon terrestrial objects:—and his contra to the sun, shedding abroad on every side his effulgent beams, and dispensing life, light and gladness to all around.

The remaining subject which I proposed to notice, is the awarding premiums for beneficial experiments and improvements in husbandry. I confess I am not satisfied of the utility of paying for the *largest* products or the *fattest* animals, yet I believe there are many other subjects on which premiums may be awarded with public advantage. If my neighbor shall be induced by the expectation of a premium, to make some new application of science, or some new experiment in practical husbandry, which shall prove successful, and lead to important public benefits, we become gainers, however expensive the investigation on the experiment may have been to him who obtains the premium. In this way great public improvements have accrued; and like means will produce like results. These rewards are often the exciting cause to active industry, philosophical research, and to the development of inventive genius; which, like the seed whose latent vitality is quickened into action by solar influence, grows, expands and matures into fruits of usefulness. Go to the American Institute at New-York, and see the numerous productions which its premiums are eliciting from science and art. Look at Scotland, a country which is surpassed by none in recent improvements in husbandry, and where agricultural premiums have been awarded for fifty years, and see its society distributing nearly ten thousand dollars a year, as rewards for diligence and skill displayed in her rural affairs. But I need not seek for illustrations abroad. They abound in every county in our state where premiums have been awarded. Upon this subject I quote again my highly respectable correspondent, who remarks in strong language—"I have no doubt that the money which was appropriated by the state to encourage agriculture, has increased the wealth of this county more than twenty per cent a year."

I have thus gone through with what I proposed to embrace in this address. I have pointed out some of the prominent defects in our husbandry, and have suggested means of remedying them at least in part. The means are partially at your command, and over them all you can exercise a salutary influence. I hope the present opportunity will not be suffered to pass without a united and successful effort to advance the objects of public usefulness for which we have associated, and for which we have met on this occasion.

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* Stephen Van Rensselaer and James Wadsworth.

Ballston, Dec. 3d, 1833.

To Jesse Buel, Esq. President of the New-York State Agricultural Society:

SIR—In reply to your letter of the 27th ultimo, in which you ask me to state to you the result of my experience of the utility and expense of under-draining farm lands, I have to observe, that it is a subject to which I have devoted some attention for the few years during which I have had an interest in agricultural pursuits, and my opinion of its great utility is confirmed by every successive day's observation.

I have applied under-draining to twenty different fields, to the extent of more than two thousand rods, and compute the average cost at half a dollar per rod. The expense, however, is determined by the proximity of materials, and the economy with which the work is performed.

I am convinced the operative farmer, who performs his own labor, can effect similar improvements considerably less than I have stated.

In some instances, the state of my lands required an expenditure of at least $20 per acre in draining. In such cases the production was coarse, unwholesome grasses, of little value, and tillage was quite out of the question. Twenty dollars per acre was the extent of the value of the land; whereas, after being effectually drained and cultivated, these lands have produced Indian corn, oats, wheat and clover in great luxuriance, paying an income on one hundred dollars the acre.

Every practical farmer is aware of the inconvenience and disadvantage attending the cultivation of fields, the different parts of which are so various as to preclude a uniform crop and uniformity of cultivation. Draining is the remedy for this.

As the improvement here treated of is of the most enduring nature, it would be unfair to charge the expense attending it upon the product of a single year. My belief is, that I have been fully remunerated by the increased products of three years in all cases; and further, in nearly every field I have, at the termination of the stone drains, durable supplies of water for animals, which, in my estimation, fully compensate the whole expense incurred.

Upon the whole, I know of no subject, connected with agricultural improvement, of more importance than draining; and if these facts I have detailed at your request, should lead a single individual to experiment on this subject, I shall deem the hour occupied in the detail fully compensated.

I am, sir, very respectfully, your ob't servant,
HENRY W. DELAVAN.

Letter from Earl Stimson to Jesse Buel, dated

Galway, 18th Dec. 1833.

DEAR SIR—In reply to yours of the 23d November, requesting some information in regard to the difference between good and bad farming, I submit the following facts:

When the land was first cleared in this town, being about forty-five years since, its timber consisted principally of beach, maple, elm, ash and basswood. The soil produced good crops of all kinds; but the farmers neglecting to save and apply their manure, the consequence was, that their crops decreased, and in about twenty-five years the land would not produce more than one-half as much, on an average, as when it was first cleared, and this half cost them more labor than when they got double the quantity of grain or grass.

The land I now till, at first, would not produce on an average, more than fifteen or twenty bushels of corn, ten or fifteen bushels of wheat, barley or rye, and from half a ton to one ton of hay per acre. I commenced making, saving and applying my manure in the most economical way on the surface, and ploughing shallow; and in ten or twelve years I found I had brought it back to its original state of fertility. My practice has been to turn over the sod in the fall or spring, spread eight or ten tons of barn-yard manure on an acre, and then plant with corn; and to follow the corn with barley and grass seeds, putting three pounds of clover and four of timothy seed on an acre; then let it lay two years to grass; then to go over with the same rotation of crops; and my third rotation was first wheat, second corn, third barley, to seed down with, applying about the same quantity of manure every time I turned over the sod. In this way, in the course of twenty years, I got some of my fields to yield from eighty to one hundred bushels of corn, thirty-five to forty bushels of wheat, fifty to sixty bushels of barley, and from two and an half to three and an half tons of hay per acre, and with less labor, except in harvesting, than when I did not raise only about one-third or one-quarter as much. I know from my own experience, that it does not cost one-half, if more than one-third as much, to raise a bushel of grain by good husbandry, as it does by bad management.

The farmers have much improved their farms in this town, since our State Agricultural Society was organized, and of course their crops have increased in proportion. *I have no doubt that the money which was appropriated by the state to encourage agriculture. has increased the wealth of this county,* MORE THAN TWENTY PER CENT A YEAR *since,* yet there seems to be a want of enterprise with our farmers in promoting their true interest.

The crops in this town were generally good the last season, except corn, which, owing to the unusually wet and cold season, did not yield more than one-third or one-half of a usual crop. I planted a field of four acres, which was in my highest state of cultivation. Occupied as pasture, I turned over the sod about the first of June, and planted it two feet eight inches apart, with eight rowed yellow corn. When the stalks were fit to cut, I had the curiosity to ascertain the weight of the corn and stalks on an acre, and found that I had 38,000 pounds, and 26,000 ears of corn. This was the heaviest growth I think that I ever raised, and I have no doubt that there was 150 or 160 bushels of corn when fit to crib.

Respectfully yours,
EARL STIMSON.

Communication from David Hosack, M. D. read before the society Feb. 12, 1834.

New-York, Jan. 26, 1834.

DEAR SIR—I rejoice to learn, from the hints dropped in the course of conversation when you were last in town, that you have it in view to recall the public attention to the subject of agriculture, which, some few years since, obtained the patronage of the legislature, and, I may add, was manifestly improved throughout this state, by the impulse it then received.

The scheme originally suggested for promoting agricultural knowledge by our late governor, De Witt Clinton, in 1818, and the valuable observations on that subject, contained in his annual messages to the legislature, since that period, cannot be too frequently called to our recollection, and made known throughout our land.

The establishment of agricultural associations of practical farmers in the different counties of this state, and who, as formerly, with the aid of legislative provision, shall be enabled to reward the enterprise and merit of those who may excel in improving the qualities of their stock, or in augmenting the various produce of the soil, must doubtless advance the interests of the farmer, diffuse a knowledge both of the principles and practice of agriculture, and increase the general resources of the state. It has also occurred to me, that the institution of one or more *schools* or *colleges*, with *farms* annexed to them, where the students of agriculture may practically acquire a knowledge of the *art* and *science* of farming combined, is a most desirable object, and cannot fail to prove highly useful to the community.

As a garden is essentially necessary to teach the culture of plants, so is the farm required to illustrate the practice and the principles of agriculture.

For this purpose, such agricultural school should be provided with competent instructors in all the different subjects necessary to constitute the *scientific* as well as the *practical* farmer.

It should be supplied not only with teachers or professors capable of instructing youth in the various departments of *practical husbandry*, and the *theory* of farming, but also with able instructors in those collateral branches of science that are directly connected with agriculture, as *geology, chemistry* and *natural history*, embracing *zoology, botany* and *mineralogy*. To these should be added lectures on *horticulture, rural economy* and *landscape gardening*.

The subject of agriculture, viewed in this extent, appears to me to claim our notice, as one of great importance to the character, as well as tributary to the interests and wealth of our state and country.

While you will doubtless recommend the society to ask from the state the appropriation of a small *premium fund*, in addition to that to be contributed as formerly by the different county societies, to be bestowed upon the most successful cultivator of the soil, or breeder of the various animals employed as stock, I hope you will not fail to urge the benefits to be derived from the establishment of an *agricultural college and farm*, where youth may be instructed in all the different departments of knowledge necessary to constitute the scientific as well as the practical cultivator of the soil: where the pupil may be instructed, by the professor of agriculture, in a knowledge of the general *principles of farming*, the *rotation of crops* as adapted to different climates, soils and situations; where he can witness the operation of the different *implements of husbandry*, obtain a knowledge of the various animals, those best suited to our climate and country, whether employed in the cultivation of the land, those most profitable for the dairy, or are most valuable as food for man: where, too, from the professor of *chemistry as connected with agriculture*, he can learn the nature and composition of *soils*, the effects of *manures*, their various sorts, whether animal, vegetable or mineral; their different qualities and operation, whether acting directly as the *food* of plants, or as *condiments*, exciting them to healthy growth: where, too, the pupil, under the professor of natural history, can acquire a knowledge of the various *trees of the forest*, whether cultivated for *timber*, for *house*, or *ship* building, whether employed in the various *mechanic arts*, or for the purpose of *fuel:* where, too, he can practi-

cally learn and witness the growth of the various *fruit trees* and *shrubs*, ascertain their different species and varieties, and their several modes of *propagation*, obtain a knowledge of the different *diseases* to which they are liable, and the means found most useful to counteract those evils: where, too, he can learn the various *seeds* and *plants* employed by the husbandman, whether cultivated as food for man, or the various animals necessary to his well being, or those vegetables tributary to the table, or cultivated with fruit, or the kitchen garden, as affording him the gratification of the *conservatory*, of the *hot-house*, or as constituting to the ornaments of the *pleasure ground*.

An agricultural college thus organized, and provided with able professors and teachers, cannot fail to prove highly useful to the community, by affording the means of education to our youth in one of the most honorable and useful professions in which they can be employed, and eminently tributary to the independence and happiness of man.

The education of youth to farming, as a distinct profession, has always appeared to me a subject that merits as much attention from our citizens, and should receive the protecting care of our legislature, as any other profession or occupation for which the various academies, schools and colleges of our state, have been established.

While immense appropriations have been made from the public purse, for the institution and maintenance of schools and colleges, as preparatory to the learned professions, as they are too exclusively denominated, no provision has been made for qualifying youth for the profession of *farming*, which is perhaps equally important to the interests and happiness of the individual, as well as to the country in general, and which calls for instruction, and embraces in its various branches a system of education equally extensive with that of any other pursuit to which the human mind can be directed. For these purposes, too, a *library* containing the standard treatises on husbandry, horticulture, rural economy, planting, landscape gardening, the various memoirs and transactions of the agricultural and horticultural societies of London, Edinburgh, France and other parts of Europe, as well as the various productions of our own country, should be attached to the proposed institution.

A lecture room, where the contemplated lessons may be delivered, containing a chemical laboratory and apparatus, furnished with the necessary tests for examining the various soils and manures, and a repository, where the various tools and implements of husbandry, and models of the different improvements in their constructions may be exhibited, are also necessary in an establishment of this nature.

A new learned profession, as it may with great propriety be denominated, being hereby presented to our notice, in addition to those of theology, law and medicine, it obviously becomes the interest of every parent who has a large family of children to provide for, to educate one or more of his sons to the profession of agriculture, as well as to those pursuits that have been enumerated.

Indeed, in some instances this healthy and active occupation holds out peculiar inducements, especially where, as in certain families, or particular members of those families, a delicate frame of body exists, or a tendency to peculiar diseases is manifested, as *scrofula* or *consumption* such pursuit would be found especially beneficial, in imparting strength to the constitution, and thereby counteracting the evils to be apprehended.

As the expense of the proposed system of education would be very moderate, and would fall within the reach of most of our citizens, and indeed of our farmers themselves, it would not fail to attract very general attention, and to invite our youth destined to reside in the country. and to engage in the cultivation of the soil, to avail themselves of the advantages of instruction in the branches enumerated, by spending one or more years in attendance upon the lectures delivered in such institution.

When we take into view the great extent of our uninhabited territory, our various soils and climates, the immediate return that would be derived from the successful cultivation of the land, by those well qualified by education to undertake its settlement, the inducements that are thereby held out to the industrious tenant, and the great encouragement it affords to families to emigrate from the present over-populous parts of our country, such a preparatory school of agricultural education appears to promise the most beneficial results. Such an establishment, too, by the great number of pupils that would resort to it from various parts of the state, and indeed from the different states of the union, would in a great degree support itself from the fees of education and of board that would be thence derived.

Such an institution might also be rendered valuable to our country in another point of view, viz. as a nursery for the education of farmers and gardeners in all the different departments of their trades and occupations.

Instead of importing persons of these professions from abroad, as has hitherto been the practice of this country, an abundant supply of both classes may be furnished from such institution, not only well qualified in all the various branches of their pursuit, but possessing a knowledge of our seasons, climate, soil and habits of culture, (in which especially the foreigner, from want of experience, must be necessarily ignorant,) that would enable them at once to perform the duties of their calling, and to the greater satisfaction of their employer, than would be expected from the stranger to our climate and our customs. *Apprentices*, too, of good moral character, taken from those classes of society who cannot defray the expenses of their education, should be received at such establishment for a certain period of time, for the purpose of being taught the various practical branches of farming and gardening.

The labor of such apprentices would also in a great degree, if not entirely, indemnify the institution for the expense incurred by their board and education.

I have with great regret observed that the valuable suggestions, on the subject of agriculture, by the late governor Clinton, whose views were not limited to the fiscal or political concerns of the state, but extended to the general interest and welfare of his fellow-men, have been so totally disregarded since his death.

I am persuaded that an institution so manifestly useful in diffusing an important branch of education, and spreading its benefits throughout our country, calls for little more than the protection given by the approbation of the state society with which you are connected, and the countenance of the legislature.

I am, dear sir, with sentiments of the greatest respect, your friend,

DAVID HOSACK.

Extract of a letter to the President of the N. Y. State Agricultural Society, dated

Saratoga Springs, Jan. 24, 1834.

With regard to an agricultural school. it has always been a favorite project with me. Agriculture is a SCIENCE, and in this country, above every other, it should form an essential part of a classical, or what is called a liberal education; and I think there can be no doubt, that if such a school was properly endowed and rightly conducted, it would be more useful and better patronized than any other in the state, or indeed in the union.

Our farmers, the best of them, have as yet advanced but a little beyond their horn-book in the science, and the reason is obvious. Their business has heretofore consisted in clearing up and in subduing new lands, and in preparing a rich and fertile natural soil for the reception of the seed; and in the management of this department of agriculture, I will venture to say they are not exceeded by any people on the face of the globe; but this is the mere rudiments, or simply the alphabet of the science. A new era has commenced in our agricultural pursuits; the new lands are principally subdued, and their soil, though naturally rich and fertile, has become exhausted, and in the common phrase, *worn out*, by the long course of unscientific tillage to which it has been subjected; and it is obvious to every one that the lands must be abandoned, or a more successful management adopted.

The great business of agriculture must now consist in renovating and reclaiming an exhausted and impoverished soil, in such a manner as to produce the greatest possible profit with the least possible expense. On this subject our farmers are but imperfectly informed, even with its practical details; of the *science* they know nothing. On this subject I could write volumes; but it is unnecessary. You know it all.

Your contemplated cheap journal is a good thing, and I doubt not it will take. I shall certainly do all in my power to encourage its circulation, and hope to be able to furnish something for its pages.

Dupes.—The greatest dupes are those who exhaust an anxious existence in the disappointments and vexations of business, and live miserably and meanly, only to die magnifiently rich.

Tillage Husbandry.

This department will be devoted to tillage crops and alternate husbandry,—or that system of farming which brings most parts of the farm successively into plough, meadow and pasture land. We consider this system as one of the greatest improvements in modern husbandry; and we shall illustrate its advantages in the communication which follows, which was prepared for, and fairly belongs to, the *Farmers' Register*. With this acknowledgment, we trust its liberal editor, Mr. RUFFIN, will be neither displeased with us, nor his correspondent.

Most of our readers have heard of, or seen, the pine plains of Kinderhook.—They were, *under the old system of farming*, deemed of little value. It is not many years since three dollars per acre was deemed a liberal price for these lands. Under the alternate system of husbandry, they have been rendered extremely profitable and valuable, and it will be seen, have recently been sold at $60 the acre. The subjoined communication will suggest useful hints to those who cultivate similar lands. Mr. Harder's is not a solitary case; but we are told exhibits a fair specimen of the system and profits of farming in that district.

PRODUCTS AND PROFITS OF A FARM OF TWO HUNDRED ACRES OF SANDY SOIL, IN 1833.

SIR,—At the solicitation of a friend I am induced to give a statement of the products of my farm for the year 1833, and of its general arrangement. In doing this, as my grain is not yet all thrashed and taken to market, I cannot now arrive at perfect accuracy; but from what is thrashed and sold, I can make a correct estimate of the quantity, and I have ascertained the price for such as has not been actually sold. My farm is situated on an extensive plain that was once covered pretty generally with small pine timber. The soil is sand, occasionally gravel, and more or less mixed with loam. It consists of two hundred acres, of which thirty acres are in wood, twenty in meadow, and ten acres of waste, leaving for cultivation about one hundred and forty acres of arable, or land used for the plough, which is divided into seven lots, of twenty acres each.—One of these lots is planted in corn, on clover sod. The corn is the large twelve rowed early yellow, and my usual produce is about fifty bushels per acre. My mode of cultivation is, that after the lot has lain one year in clover, to plough it the last of April or first of May, about six inches deep; then furrow both ways with a light corn plough; the first time across the furrows about two feet nine inches apart, the next about three feet. I plant immediately after furrowing. As soon as the corn is up the length of the finger, I harrow it with a large heavy harrow lengthwise with the furrow, as the ground was originally ploughed, and take two rows at a time. Two men or boys follow the harrow with aprons, out of which they plaster the corn, and also raise any plants which may have been thrown down by the harrow passing over them. In a week after, I plough once between the rows, as they are planted the narrowest way; the men follow with the hoe, and they will finish twenty acres in ten days. In about a fortnight more, I plough it the widest way of planting, twice between the rows, and throw the ground towards the plant. I cut the stalk above the ear as soon as the kernel in the ear is hard, and secure the stalks in shooks. We husk the corn on the hill, and two men will gather one hundred bushels of ears in a day. The lot which was in corn, I put down the succeeding year to oats, and it commonly produces about forty bushels per acre.—This lot I seed down with western clover seed, eight quarts per acre. Two lots are in wheat, which were likewise the year previous in clover seed. The one is ploughed the first of August, and again just previous to sowing in September; the other but once, the last of August or first of September, about a fortnight previous to sowing. These lots have the benefit of my barn manure, which is scattered on such portions as I think require it most.

I commonly sow about one bushel twelve quarts per acre, and my common yield is twenty bushels of wheat per acre. Thus four lots are employed, one in corn, one in oats, two in wheat; the remaining three are in pasture. Two of these are again to be ploughed up in the fall for wheat, and the remaining one is for corn the succeeding season. The experience of twenty years has confirmed me in the belief that this is the most successful mode of cultivation in our soil, and I have at all events been satisfied with the amount of produce my farm has yielded me. I annex a statement showing the amount of produce and the proceeds therefrom, of my farm, for the year 1833, and the expenses of its management.

	Cr.	
20 acres meadow, 2 tons hay per acre, sold at $7½ per ton,		$300 00
20 acres producing 1,000 bushels corn, for which I am offered 62½ cts. per bushel,		625 00
40 acres producing 800 bushels wheat, sold *a* 8‖6,		850 00
20 acres producing 800 bushels oats, sold *a* 37½,		300 00
500 bushels potatoes *a* 2‖,		125 00
3000 weight of pork, *a* $5.50,		165 00
Sold one beef,		25 00
500 lbs. butter, *a* 16 cts.		80 00
225 lbs. wool, *a* 4‖,		112 00
55 lambs, increase of my flock,		80 00
		$2,662 00

The item of pasturage not put down.

	Dr.	
To hiring one man per year,	$100 00	
To do do seven months,	70 00	
To hiring 15 days in haying and harvest,	13 12	
3½ tons plaster, *a* $7.50,	25 25	
3½ bushels clover seed, *a* $7.50,	25 25	
Taxes,	15 00	
Mechanics' bills,	50 00	
	$320 62	
		320 62
Income,		$2,341 38
The farm sold *a* $60, for 200 acres,	$12,000	
Stock and implements valued at	1,000	
	$13,000	
Interest on this sum at 7 per cent,		910 38
Gain,		$1,431 00

Making the entire interest upon $13,000, after deducting expenses, about 18 per cent. There are other profits from the farm not enumerated in the within statements, such as house-rent, garden, orcharding, raising of poultry, &c. I will put them against any little incidental expenses not enumerated, but which they will be amply sufficient to defray. The labor upon my farm is performed by two men as above stated, but under my own direction, and all our operations tend to lessen the amount of labor as much as practicable; and I find that nothing conduces more to this result than to keep ahead of my work through the season. For myself, I labor but moderately, but keep up a constant supervision. I will only farther add, that since I have adopted the principle of total abstinence from ardent spirits, at all seasons of the year, I think I have not only gained vastly in the amount of work done by my men, but my farming business has gone on more cheerfully.

Yours respectfully,

TEUNIS HARDER.

Kinderhook, Columbia co. Jan. 14, 1834.

ROTATION OF CROPS.

We find a great deal said in English publications, of the importance of a rotation of crops; and although we may receive, and doubtless do receive, many valuable hints from our trans-atlantic brethren, yet their soil, their climate, their markets, and price of labor, are so different, as to render it highly improper for the American farmer implicitly to follow their directions. Indeed, it would be imprudent to follow the directions of the best farmers of New-England, for the good reasons, that our most valuable products, as well as our soils, are different. In western New-York the soil is well adapted to wheat. It is the great staple. To that the farmer looks to supply him with money. That mode of farming, therefore, which produces this crop in the greatest perfection, is the one he ought to pursue. It is well known that land may be too rich for wheat, and that the application of barn-yard manure immediately preceding a crop of wheat, is considered by the best farmers injudicious. I am in favor of an alternation of crops, and have found the following to answer best on my farm, which is considered a good wheat soil.

Indian corn is a gross feeder; indeed it is impossible to make land too rich for it; I therefore give my corn and potato ground al-

the manure I can collect, and if the corn be planted early, and well tended, it may be cut and drawn off in season for wheat, and the ground put in a good state to receive it by one ploughing. If however the farmer have sufficient ground for wheat without it, the better method is to put on barley or peas next season, and as soon as the crop is taken off, give the ground a thorough harrowing, which will cause the seeds that may have dropped, to vegetate, in which state it should be left till near the time of seeding, when one good ploughing will be better than more. Then run a light harrow over it, which puts the ground in a better state to receive the wheat. Then harrow twice and follow with the roller, when every good farmer will strike water furrows. By this mode of management, all the vegetable matter which may have sprung up will be completely *buried in the soil*, and there remain to enrich it.

Few farmers occupy as many acres with corn, potatoes and ruta baga, as they wish to sow with wheat. If the system of clovering is pursued, (which I recommend to every farmer,) I deem naked fallows unnecessary. A good sward turned in, after plastering—if a heavy soil, in the fall, if light in the spring—rolled, and then harrowed, will put the ground in a fine state for peas, barley or oats.—Immediately after the crops are taken off, proceed as above directed, and if the land be in good heart, we may safely calculate on a good crop of wheat. If the land be rich, I have frequently taken a second crop of wheat before seeding with grass, equally heavy with the first.

This mode cannot be profitably pursued unless the land is rich; and if not so, green crops ploughed in will make it so. I have this year turned in a heavy crop of buckwheat in blossom, in a field exhausted by the previous occupant. I then sowed wheat, and shall give it at least ten pounds of clover seed per acre early in the spring, and then plaster.

Some of the best farmers of Pennsylvania assert, that calcareous land may be made to produce heavy crops of wheat for several successive years by means of clover and plaster sown every year; and where the farmer raises his own clover seed, he may sow it in the chaff, and find the method profitable, not only as it relates to crops, but what is equally important, his land is continually growing richer. I have not given this method a trial, but intend to do it. If found to succeed, it will go to establish a fact not yet settled, that clover restores to the land the principles yielding starch and gluten, without which wheat cannot perfect itself. This fact once established, the farmers of our western country will raise of other crops no more than may be necessary for their own consumption.

I saw the last of five successive crops of wheat growing in the calcareous soil on the east bank of Cayuga Lake, which was estimated to yield 25 bushels per acre. If then this soil, managed as in Pennsylvania, actually furnishes the pabulum of wheat, may we not draw the conclusion, that such soils only as are primitive, or are destitute of lime, require a regular rotation of crops!—*Genesee Farmer.*

Cattle Husbandry.

Under this head we purpose to give what we deem most likely to benefit the cattle farmer, in the selecting, breeding, rearing and improving his farm stock. We shall particularly describe the *improved short horn* and *Devon* cattle, and give such criteria of a good animal of those and other breeds, as will assist the breeder or buyer in estimating their genuineness and relative value, and tend to prevent imposition. We shall endeavor to point out the relative value of the several kinds for breeding, grazing, the dairy and the plough.

Within the last century the cattle of Great Britain have been made nearly to double their average weight. This has in a measure resulted from the improved condition of husbandry generally, but principally from a judicious system of breeding. Most of the improved breeds of animals which our farmers are desirous of propagating, have been derived recently from Great Britain, where the art of breeding is carried to higher perfection than in any other country. Hence it is in British practice, and British publications, which are the record of that practice, that we must seek for the best guides for our improvement. And in fulfilling our task, we intend to consult some of the most approved and recent authorities.

The neat cattle of England have been classed under the heads of

1. *Long horns*, including the improved stock of Bakewell;
2. *Middle horns*, including Devon and Hereford cattle;
3. *Short horns*, comprising Teeswater, Holderness, Durham, and Improved Short Horns;
4. *Hornless*, or polled, or Galloway breed; and,
5. *Crumpled horns*, or Alderney, derived from France.

From these general classes all of our native cattle have been derived; and in Great Britain, as here, they have become intermingled in every possible way. Yet while every thing *here* has been left too much to chance, *there* a systematic course has been successfully pursued, by many distinguished breeders, to improve the original breeds. Before we proceed, however, to describe the manner and extent of the improvement which has taken place, or the form of the improved animals, we will quote what we find laid down, and we think correctly, as the

PROPER FORM AND SHAPE OF CATTLE.

"Whatever be the breed, there are certain conformations which are indispensable to the thriving and value of the ox or cow. When we have a clear idea of these, we shall be able more easily to form an accurate judgment of the breeds of the different counties as they pass before us. If there is one part of the frame, the form of which, more than that of any other, renders the animal valuable, it is the chest. There must be room enough for the heart to beat, and the lungs to play, or sufficient blood for the purposes of nutriment and of strength will not be circulated; nor will it thoroughly undergo that vital change which is essential to the proper discharge of every function. We look therefore, first of all, to the wide and deep girth about the heart and lungs. We must have both; the proportion in which the one or the other may preponderate, will depend on the service we require from the animal; we can excuse a slight degree of flatness of the sides, for he will be lighter in the forehand, and more active; but the grazier must have width as well as depth.—And not only about the heart and lungs, but over the whole ribs, must we have length and roundness; the *hooped*, as well as the deep barrel, is essential; there must be room for the capacious paunch, room for the materials from which the blood is to be provided. The beast should also be ribbed home; there should be a little space between the ribs and the hips. This seems to be indispensable in the ox, as it regards a good healthy constitution, and a propensity to fatten; but a largeness and dropping of the belly is excusable in the cow, or rather, notwithstanding it diminishes the beauty of the animal, it leaves room for the udder; and if it is also accompanied by swelling milk-veins, it generally indicates her value in the dairy.

"The roundness and depth of the barrel, however, is most advantageous in proportion as it is found behind the point of the elbow, more than between the shoulders and legs; or low down between the legs, rather than upwards towards the withers; for it diminishes the heaviness before, and the comparative bulk of the coarse parts of the animal, which is always a very great consideration.

"The loins should be wide: of this there can be no doubt, for they are the prime parts; they should seem to extend far along the back; and although the belly should not hang down, the flanks should be round and deep. Of the hips it is superfluous to say that, without being ragged, they should be large; round rather than wide, and presenting, when handled, plenty of muscle and fat. The *thighs* should be round and long, close together when viewed from behind, and the farther down they continue to be so the better. The legs short, varying like other parts, according to the destination of the animal; but decidedly short, for there is an almost inseparable connection between length of leg and lightness of carcases, and shortness of leg and propensity to fatten. The bones of the legs, and they only being taken as a sample of the bony structure of the frame generally, should be small, but not too small—small enough for the well known accompaniment,—a propensity to fatten—small enough to please the consumer; but not so small as to indicate delicacy of constitution, and liability to disease.

"Last of all the hide—the most important part of all—thin, but not so thin as to indicate that the animal can endure no hardship; moveable, mellow, but not too loose, and particularly well covered with fine soft hair."

Ill-natured Jests.—If it is dangerous to speak of ourselves, it is much more so to take freedoms with other people. A jest may tickle many; but, if it hurts one, the resentment that follows it may do you more injury than the reputation service.

Science of Agriculture.

ALL KNOWLEDGE IS FOUNDED ON EPPERIENCE.

In the infancy of any art experience is confined and knowledge limited to a few particulars; but as arts are improved and extended, a great number of facts become known, and the generalization of these, or the arrangement of them according to some legal principle, constitutes the theory, science, or law of an art.

Agriculture, in common with other arts, may be practised without any knowledge of its theory; that is established practises may be imitated; but in this place it must ever remain stationary The mere routine practitioner cannot advance beyond the limits of his own particular experience, and can neither derive instruction from such accidents as are favorable to his object, nor guard against the occurrence of such as are unfavorable. He can have no resources for unforeseen events, but ordinary expedients; while the man of science resorts to general principles, refers events to their causes, and adopts his measures to meet every case.

IMPROVING THE BREEDS OF ANIMALS.

By improving of a breed, is to be understood the producing such an alteration in shape or description, as shall render the animal better fitted for the labors he has to perform; better fitted for becoming fat; or for producing milk, wool, eggs, feathers, or particular qualities of these. The fundamental principle of this amelioration is the proper selection of parents. Two theories have obtained notice on this subject, the one in favor of breeding from individuals of the same parentage, called the *in-and-in* system, and the other in favor of breeding from individuals of two different off-prings, called the system of *cross-breeding.*

That the breed of animals is improved by the largest males, is a very general opinion, but this opinion is the reverse of the truth, and has done considerable mischief. The great object of breeding, by whatever mode, is the improvement of form, and experience has proved, that crossing has only improved, in an eminent degree, in those instances in which the females were larger than the usual proportion of females to males, and that it has generally failed where the males were disproportionably large. (*Cully's Introduction, &c.*) The following epitome of the science of breeding, is by the late eminent surgeon, HENRY CLINE, who practised it extensively on his own farm at Southgate.

The *lungs* are of the first importance. It is on their size and soundness that the strength and health of animals principally depends. The power of converting food into nourishment is in proportion to their size. An animal of large lungs is capable of converting a given quantity of food into more nourishment than one with smaller lungs; and therefore has a greater appitude to fatten.

The *chest,* according to its external form and size, indicates the size of the lungs. The form of the chest should approach the figure of a cone, having its apex situated between the shoulders, and its base towards the loins. Its capacity depends on its form more than on the extent of its circumference; for where the chest is equal in two animals, one may have much larger lungs than the other. A circle contains more than an elipsis of equal circumference; and in proportion as the elipsis deviates from the circle, it contains less. A deep chest, therefore, is not capacious, unless it is proportionally round.

The *pelvis* is the cavity formed by the junction of the haunch bones with the bone of the rump. It is essential that the cavity should be large in the female, that she may be enabled to bring forth her young with less difficulty. Where the cavity is small the life of the mother and her off-spring are endangered. The size of the pelvis is chiefly indicated by the width of the hips, and the breadth of the waist, which is the space between the thighs. The breadth of the loins is always in proportion to that of the chest and pelvis.

The *head* should be small, by which the birth is facilitated. Its smallness affords other advantages, and generally indicates that the animal is of a good breed. Horns are useless to domestic animals and they are often the cause of accidents. It is not difficult to breed animals without horns. The breeders of horned cattle and horned sheep sustain a loss more sensible than they conceive; for it is not the horns alone, but also much bone in the skulls of such animals to support the horns, for which the butcher pays nothing; and besides this there is an additional quantity of ligament and muscle in the neck, which is of small value. The skull of a ram with horns weighed five times more than a skull which was hornless. Both these skulls were taken from sheep of the same age, each being four years old. The great difference in weight depended chiefly on the horns, for the lower jaws were nearly equal; one weighing seven ounces, and the other six ounces and three quarters, which proves that the natural size of the head was the same in both, independent of the horns and the thickness of the bones which support them. In horned animals the skull is extremely thick. In a hornless animal it is much thinner, especially in that part where the horns usually grow. To those who have reflected on the subject it may appear of little consequence whether sheep and cattle have horns, but on a moderate calculation it will be found, that the loss in farming stock, and also in the dimunition of animal food is very considerable, from the production of horns and their appendages. A mode of breeding which should prevent the production of these, would afford a considerable profit in an increase of meat, wool, and other valuable parts.

The length of the neck, should be proportioned to the height of the animal that it may collect its food with ease.

The muscles, and the tendons, which are their appendages, should be large; by which an animal is enabled to travel with greater facility.

The bones, when large, are commonly considered an indication of strength; but strength does not depend on the size of the bones, but on that of the muscles. Many animals with large bones are weak, their muscles being small. Animals that have been imperfectly nourished during their growth, have their bones disproportionately large. If such deficiency of nourishment originated from a constitutional defect, which is the most frequent cause, they remain weak during life. Large bones, therefore, generally indicate an imperfection in the organs of nutrition.

To obtain the most approved form, the two modes of breeding described as the in-and-in and crossing modes have been practised. The first mode may be the better practice, when a particular variety approaches perfection in form; especially with those who may not be acquainted with the principles on which improvement depends. When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionably larger than the male, the off-pring is of an improved form. For instance, if a well formed large ram be put to ewes proportionately smaller, the lambs will not be so well shaped as their parents; but if a small ram be put to large ewes, the lambs will be of an improved form. The proper method of improving the form of animals, consists in selecting a well formed female proportionately larger than the male. The improvement depends on this principle, that the power of the female to supply the off-pring with nourishment is in proportion to her size, and to the power of nourishing herself from the excellence of her constitution. The size of the fœtus is generally in proportion to that of the male parent; and, therefore, when the female parent is proportionably small, the quantity of nourishment is deficient, and her offspring has all the disproportions of a starveling. But when the female, from her size and good constitution, is more than adequate to the nourishment of a fœtus of a smaller male than herself, the growth must be proportionately greater. The larger female has also a larger quantity of milk, and her off-spring is more abundantly supplied with nourishment after birth.

Abundant nourishment is necessary to produce the most perfect formed animals, from the earliest period of its existence until its growth is complete. As already observed, the power to prepare the greatest quantity of nourishment from a given quantity of food, depends principally on the magnitude of the lungs, to which the organs of digestion are subservient. To obtain animals with larger lungs, crossing is the most expeditious method; because well formed females may be selected from a larger size, to be put to a well formed male of a variety that is rather smaller. By such a mode of crossing, the lungs and heart become proportionately larger, in consequence of a peculiarity in the circulation of the fœtus, which causes a larger proportion of the blood, under such circumstances, to be distributed to the lungs, than to the other parts of the body: and as the shape and size of the chest depend upon that of the lungs, hence arises the remarkably large chests which is produced by crossing with females that are larger than males. The practice, according to this principle of improvement, however, ought to be limited; for it may be carried to such an extent, that the bulk of the body might be so

disproportioned to the size of the limbs as to prevent the animal from moving with sufficient facility. In animals, where activity is required, this practice should not be extended so far as in those which are intended for the food of man.

The character of animals, or the external appearance by which the varieties of the same species are distinguished, are observed in the offspring; but those of the male parent more frequently predominate. Thus, in the breeding of horned animals, there are many varieties of sheep, and some of cattle, which are hornless. If a hornless ram be put to horned ewes, almost all the lambs will be horniess; partaking of the character of the male more than of the female parent. An offspring without horns, or rarely producing horns, might be obtained from the Devonshire cattle, by crossing with bulls of the Galloway breed, which would often improve the form of the chest, in which the Devonshire cattle are often deficient.

Examples of the good effects of crossing may be found in the improved breeds of horses and swine in England. The great improvement in the breed of horses arose from the crossing with the diminutive stallions, Barbs, and Arabians; and the introduction of Flanders mares into the country was the source of improvement in the breed of cart horses. The form of the swine has been greatly improved by crossing with the small Chinese boar.

Examples of the bad effects of crossing a breed, are more numerous. When it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their stallions to much larger mares than usual, and thus did infinite mischief to their breed, by producing a race of small chested, long-legged, large-boned, worthless animals. A similar project was adopted in Normandy, to enlarge the breed of horses there, by the use of stallions from Holstein; and in consequence the best breed of horses in France would have been spoiled, had not the farmers discovered the mistake in time, by observing the offspring much inferior in form to that of their native stallions. Some graziers in the isle of Sheppy conceived that they could improve their sheep by large Lincolnshire rams; the produce of which, however, was much inferior in the shape of the carcass and the quantity of the wool; and the flocks were greatly impaired by this attempt to improve them. Attempts to improve the animals of a country by any plan of crossing should be made with the greatest caution; for by mistaken practice, extensively pursued, irreparable mischiefs may be done. In any country where a particular race of animals has continued for centuries, it may be presumed that their constitution is adapted to the food and climate.

It may be proper to improve the form of a native race, but at the same time it may be very injudicious to attempt to change their size; for the size of animals is commonly adapted to the soil and climate which they inhabit. Where produce is nutritive and abundant, the animals are large, having grown proportionally to the quantity of food which, for generations, they have been accustomed to obtain. Where the produce is scanty, the animals are small, being proportioned to the quantity of food which they were able to procure. Of these contrasts, the sheep of Lincolnshire and Wales are samples. The sheep of Lincolnshire would starve on the mountains of Wales.

Crossing the breeds of animals may be attended with bad effects in various ways, and that even when adopted in the beginning on a good principle; for instance, suppose some larger ewes than those of the native breed, were taken to the mountains of Wales, and put to the rams of that country; if these foreign ewes were fed in proportion to their size, their lambs would be of an improved form, and larger in size than the native animals; but the males produced by cross, though of a good form, would be disproportionate in size to the native ewes; and, therefore, if permitted to mix with them, would be productive of a starveling, ill-formed progeny. Thus a cross, which at first was an improvement, would, by giving occasion to a contrary cross, ultimately prejudice the breed. The general mistake in crossing has arisen from an attempt to increase the size of a native race of animals; being a fruitless effort to encounter the laws of nature.

From theory, from practice, and from extensive observation, the last more to be depended on than either, "it is reasonable," Cline continues, "to form this *conclusion:* it is wrong to enlarge a native breed of animals, for in proportion to their increase of size, they become worse in form, less hardy, and more liable to disease."—*Communications to the B. of Agriculture, Vol. IV. p.* 446.

Miscellaneous.

GATHERING AND CURING HOPS.

Taking the crop is the most important operation in the hop economy. Hops are known to be ready for pulling when they acquire a strong scent, and the seeds become firm and of a brown colour, which in ordinary seasons, happens in the first or second week of September. And when the pulling season arrives, the utmost assiduity is requisite on the part of the planter, in order that the different operations may be carried on with regularity and despatch; as the least neglect in any department of the business, proves in a great degree ruinous to the most abundant crop, especially in precarious seasons. Gales of wind at that season, by breaking the lateral branches and bruising the hops, prove nearly as injurious as a long continuance of rainy weather, which never fails to spoil the colour of the crop, and thereby render it less saleable.

As a preparation for pulling the hops, frames of wood, in number proportioned to the size of the ground, and the pickers to be employed, are placed in that part of the field which, by having been most exposed to the sun, is soonest ready. These frames, which are called *bens* or *cribs*, are very simple in the construction, being only four pieces of boards nailed to four post, or legs, and when finished, are about seven or eight feet long, three feet broad and about the same height. A man always attends the pickers, whose business it is to cut over the vines near the ground, and to lay the poles on the frames to be picked. Commonly two, but seldom more than three poles are laid on at a time. Six, seven, or eight pickers (women, girls, and boys) are employed at the same frame, three or four being ranged on each side. These, with the man who sorts the poles; are called a set. The hops after being carefully separated from the leaves and branches, or stalks, are dropped by the pickers into a large cloth, hung all around within side of the frame with tenter-hooks. When the cloth is full, the hops are emptied into a large sack, which is carried home, and the hops lain on a kiln to be dried. This is always done as soon as possible after they are picked, as they are apt to sustain considerable damage, both in color and flavor, if allowed to remain long in sacks, in the green state in which they are pulled. In very warm weather, and when they are pulled in a moist state, they will often heat in five or six hours; for this reason the kilns are kept constantly at work, both night and day, from the commencement to the conclusion of the hopping season.

To set on a sufficient number of hands, is a matter of prudence in the picking season, that the vast or kilns may never be unsupplied with hops; and if it is found that the hops rise faster than could have been expected, and that there are more gathered in a day than can be conveniently dried off, some of the worst pickers may be discharged; it being very prejudicial for the green hops to continue long in the sacks before they are put on the vast, as they will in a few hours begin to heat, and acquire an unsightly colour, which will not be taken off in the drying, especially if the season be very moist; though, in a wet hopping, it is no easy matter to prevent the kilns from being overrun, supposing that there were pickers enough to supply them if the weather had been dry, because in a cold wet time the hops require to lie a considerable while longer on the kiln, in order that the superabundant moisture may be dried up. It is therefore expedient in this case that each measuring be divided into a number of green pockets or pokes. The number of bushels in a poke ought never to exceed eleven: but when the hops are wet, or likely to continue together some time before they go on the kiln, the better way is to put only eight bushels in a sack, pocket or poke.

Donaldson asserts, that diligent hop pickers, when the crop is tolerable abundant, will pick from eight to ten bushels each in a day, which when dry, will weigh about one hundred weight, and that it is common to set the picking of hop grounds by the bushel. The price is extremely variable, depending no less on the goodness of crop than on the abundance or scarcity of laborers. The greatest part of the hops cultivated in England are picked by people who make a practice of coming annually from the remote part of Wales for that purpose.—*Enc. of Ag.*

The operation of drying hops, is not materially different from that of drying malt, and the kilns, or vasts, are of the same construction. They should be dried as soon as possible after they are gathered; if not immediately, they must be spread on a floor to prevent their changing colour. The best mode of drying them is with a fire of

charcoal, on a kiln covered wih hair cloth, in the manner of a malt kiln.* The fire must be kept steady and equal, and the hops stirred gently. Great attention is necessary in this part of the business, that the hops may be uniformly and sufficiently dried; if too much dried they will look brown, as if they were burned; and if too little dried, they will lose their colour and flavor. They should be laid on the hair cloth about six inches thick, after it has been moderately warmed; then a steady fire kept up till the hops are nearly dry, lest the moisture or sweat, which the fire has raised, should fall back and change their colour. After the hops have been in this situation seven, eight, or nine hours, and have got a thorough sweating, and when struck with a stick, will leap up, then throw them into a heap; mix them well and spread them again, and let them remain till they are all equally dry. While they are in the sweat, it will be best not to move them, for fear of burning them. Slacken the fire when the hops are to be turned, and increase it afterwards. Hops are fully dried when their stalks break short, and their leaves are crisp and fall off easily. They will crackle a little when their leaves are bursting; and then they must be taken from the kiln. Hops that are dried in the sun, lose their rich flavor, and if under cover, they are apt to ferment and change with the weather, and lose their strength. Fire preserves the colour and flavor of hops, by evaporating the water, and retaining the oil of the hop. After the hops are taken from the kiln, they should be laid in a heap, to acquire a little moisture, to fit them for bagging. It would be well to exclude them from the air, by covering them with blankets. Three or four days will be sufficient for them to lie in that state. When the hops are so moist as to be pressed together without breaking, they are fit for bagging. Bags made of coarse linen cloth, eleven feet in length, and seven in circumference, which hold two hundred pounds weight, are most commonly used in Europe; but any size that best suits may be made use of. To bag hops, a hole is made through a floor large enough for a man to pass with ease; the bag must be fastened to a loop larger than the hole, that the floor may serve to support the bag, and for the convenience of handling the bag, some loops should be tied in each corner to serve as handles. The hops should be gradually thrown into the bag, and trod down continually till the bag is filled. The mouth of the bag must then be sewed up, and the hops are fit for market. The harder hops are packed, the longer and better they will keep; but they must be kept dry. In most parts of Great Britain where hops are cultivated, they estimate the charges of cultivating an acre of hops at forty-two dollars, for manuring and tilling, exclusive of poles and rent of land. Poles they estimate at sixteen dollars per year; but in this country they would not amount to half that sum. An acre is computed to require about three thousand poles, which will last from six to twelve years, according to the kind of wood used.

The English growers of hops think they have a very indifferent crop, if the produce of an acre does not sell for an hundred and thirty-three dollars, and it frequently sells for two hundred dollars, and has been known to rise as high as four hundred dollars. In this country experiments have been equally flattering. A gentleman in Massachusetts, in the summer of 1801, raised hops from one acre of ground that sold for three hundred dollars; and land is equally good for hops in this state. Upon the lowest estimate, we may fairly compute the nett profit of an acre of hops to be eighty dollars, over and above poles, manure and cultivation.—*Tr. Ag. Soc. N. Y.*

The produce of the hop crop is liable to a very considerable variation, according to soil and season, from two or three to so much as twenty hundred weight; but from nine to ten, on middling soils, in tolerable seasons, are considered as average crops, and twelve or fourteen as good ones. Bannister asserts, that sixty bushels of fresh gathered hops, if fully ripe, and not injured by the fly or other accident, will, when dried and bagged, produce a hundred weight. When the hops are much eaten by the flea, a disaster which often befals them, the sample is not only reduced in value, but the weight diminished; so that, when the misfortune occurs, the planter experiences a twofold loss.

To judge of the quality of hops, as the chief virtue resides in the yellow powder contained in them, which is termed the condition and is of an unctuous and clammy nature, the more or less clammy the sample appears to be, the value will be increased or diminished in the opinion of the buyer. To this may be added the colour, which it is of very material consequence for the planter to preserve as bright as possible, since the purchaser will insist much on this article; though perhaps the brightest coloured hops are not always the best flavored.

The duration of the hop plantation on good soil, may be from fifteen to thirty years; but in general they begin to decline about the tenth. Some advise that the plantation should be destroyed, and a fresh one made elsewhere; other consider it the best plan to break up and plant a portion of new ground every two years, letting an equal quantity of the old be destroyed, as in this way a regular succession of good plantation will be kept up at a trifling charge.—*Enc. of Ag.*

* Mats made of the splinters of Walnut, or rush, will answer the purpose and come cheaper than hair cloth.

GO TO WORK THE RIGHT WAY.

Addressed to Farmers.

I am sorry there is so much need of the admonitions I am about to give. Depend upon it, you do not "*work it right,*" or you would make your farms just twice as valuable as they now are. Many of you *farm too much.* You would find it much more profitable to farm twenty acres well, than forty by halves. The last season, I made my grounds produce at the rate of one hundred bushels of Indian corn to the acre. Is this not much better than a common crop of thirty or forty bushels? You will certainly say it is, and with the same breath ask how I manage to make it produce so plentifully? My land being much infested with ground mice, or moles, and overrun with grubs and other vermin, I put on early in the month of March, about seven bushels of salt to the acre, which thoroughly destroys all kinds of vermin, being an excellent strong manure, and ploughed and harrowed the ground over and over until it became completely mellow. I then had every corn hole filled with long manure; and after dropping my corn, (which had previously been soaked in warm water,) I scattered a pint of lime over every hill, and then covered the whole with a little mellow earth. In about a week the corn began to come up plentifully; after which I nursed it with the plough and hoe, every other week for eight weeks, at which time it was as high as my head, and not a spire of it was destroyed either by frost, grub or birds. My other things I manured equally well, and I have been amply paid for all my extra care and trouble, as I raised more than twice as much per acre as any of my neighbors, and did it in much less time. I mean I got all my harvesting done two or three weeks before many others. This is accomplished in a great measure by redeeming time: rising between three and four o'clock in the morning; then if the day be sultry and hot, I lie by from twelve to three, and rest; I then feel refreshed, and able to work till quite dark. This I call "*working it right;*" whereas should I lay in bed until the sun be up and shame me, haunt the tavern at night, drink too much whiskey, but half manure, half plough, half plant, half nurse, half harvest, and do every thing by halves, I surely should not "*work it right,*" nor get half a crop.

I shall now conclude by giving you, for further consideration, a few excellent observations, from a wiser head, perhaps, than my own, and hope that every brother farmer will do likewise.

"I often say to myself, what a pity it is our farmers *do not work it right!* When I see a man turn his cattle into the road to run at large, and waste their manure during a winter's day, I say that man *does not work it right.* Ten loads of good manure, at least, is lost in a season, by this slovenly practice—and all for what? For nothing indeed but to ruin his farm.

"So when I see cattle, late in the fall and early in the spring, rambling in a meadow or mowing field, pounding the soil and breaking the grass roots, I say to myself, this man *does not work it right.*

"So, when I see a barn-yard with a drain to it, I say this man *does not work it right;* for how easy it is to make a yard hollow or lowest in the middle, to receive the moisture and all the wash of the sides, which will thus be kept dry for the cattle. The wash and moisture of the yard, mixed with any kind of earth, or putrid straw, is excellent manure; yet how much do our farmers lose by neglecting these things! In fact, *they do not work it right.*

"When I see a farmer often going to a retailer's store, with a bottle or jug, or lounging about a tavern or wrangling about politics, or quarrelling and defaming his neighbor's good name, I am certain such a man *does not work it right.*"—*Prov. Repub. Herald.*

HINTS TO HOUSEWIVES.

Vessels intended to contain liquid of a higher temperature than the surrounding medium, and to keep that liquid as long as possible at the highest temperature, should be constructed of materials which are the worst radiators of heat. Thus, tea urns and tea pots are

best adapted for their purpose when constructed of polished metal, and worst when constructed of black porcelain. A black porcelain tea pot is the worst conceivable material for that vessel, for both its materials and colour are good radiators of heat, and the liquid contained in it cools with the greatest possible rapidity. On the other hand, a bright metal tea-pot is best adapted for the purpose, because it is the worst radiator of heat, and therefore cools as slowly as possible. A polished silver or brass tea urn is better adapted to retain the heat of the water, than one of a dull brown colour, such as is most commonly used. A tin kettle retains the heat of water boiled in it more effectually if it be kept clean and polished, than if it be allowed to collect the smoke and soot to which it is exposed from the action of the fire. When coated with this, its surface becomes rough and black, and is a powerful radiator of heat. A set of polished fire irons may remain for a long time in front of a hot fire, without receiving from it any increase of temperature beyond that of the chamber, because the heat radiated by the fire is all reflected by the polished surface of the irons, and none of it is absorbed; but if a set of rough, unpolished irons were similarly placed, they would become speedily so hot, that they could not be used without inconvenience. The polish of fire irons is, therefore, not merely a matter of ornament, but of use and convenience. The rough, unpolished poker, sometimes used in a kitchen, becomes speedily so hot that it cannot be held without pain. A close stove, intended to warm apartments, should not have a polished surface, for in that case it is one of the worst radiators of heat, and nothing could be contrived less fit for the purpose to which it is applied. On the other hand, a rough, unpolished surface of cast iron, is favorable to radiation, and a fire in such a stove will always produce a most powerful effect.—*Cabinet Cyclopædia.—Dr. Lardner, on Heat.*

CHEAP FARMING.

I have been much gratified by the receipt and perusal of your first number of the Farmers' Register.

I wish your paper may have the effect of producing some amendment in our farming; and that you may be remunerated for your labor and good intentions. I am greatly fearful, however, of your success in both respects.

We Virginia farmers, (I mean such as I am, who are at least four-fifths of the whole,) require to have some plan devised, by which, without *much labor*, and with *no expense*, we may improve our lands, and that speedily, or we will remove to the western forests, and encounter all the labor and privations attending a new settlement. We have no notion of submitting to the tardy and laborious system of your *real farmer*. We go for a kind of *slight of hand* or *no work* plan—or we are off.

Our general course of operations has been, to cultivate our lands in corn one year, and *rest them* in wheat the next; and so on, until they are prepared for a good crop of *old field pines*——the best crop, by the way, since the introduction of steam-boats, of the whole.

A piece of land thus *highly improved*, I got possession of some years ago; but instead of waiting patiently for the *pine crop*, I determined I would cultivate it every year in corn, until I got it rich; and this too without manure, although I lived near a town where any quantity might have been had; but I scorned all such *foreign aid.*

I prepared the land early, and having procured some buckwheat, I mixed it with oats, and sowed them in March or April. In due time, I planted my corn in drills, say eight feet apart. I ran a single coulter deep on each side; hoed and thinned the corn; and, in due course, turned a slice to it, and gave it another dressing with the hoes. I took no more than was absolutely necessary for the corn, from the oats and buckwheat, until it became proper to break the middlings, and *lay by* the corn. By this time the oats were so matured that the seed would vegetate. I preceded the plough by coultering deep with a single coulter, so as to pulverize the middlings, and then turned them with their coat of oats and buckwheat on the corn, drawing the dirt over the straw with hoes, so as to cover it up pretty well. The corn was a sorry crop, but the ground was well covered with young oats. These I turned in, in the fall, and proceeded in like manner the next year, with this difference, that I had no buckwheat to mix with my oats. This was a bad *look out;* but as it required some little foresight and management to avoid this mishap, it was *beyond me.*

I had heard of the chinck bug, but had never seen it; and knew not its great fondness for oats. My last ploughing, instead of destroying, saved it even the trouble of travelling to the corn: It had nothing to do but to "*arise, slay and eat.*"

Being thus rudely and unexpectedly assailed in my *grand experiment*, I had nothing left but to sow the land down in rye, which I had tried without success, before I began my experiment. From what cause it proceeded, you know better than I do; but so it is, I have rarely seen a heavier crop of rye than I obtained from this sowing.

I sold the land soon after, and so ends *that experiment.*

I have lately purchased another tract, improved to the *pine crop state* also; inasmuch that a crop of rye on part of a field where I purchased, was too mean to be cut; and I ran a harrow over it so as to prostrate it. I observed that even this slight cover produced such a change in the appearance of the ground that I determined last fall to make *another experiment*, if such it may be called.

After taking off a crop of wheat, preceded by one of corn, as usual, and after pasturing the land with stock of every kind, as *imprudently* as any *experimentalist could require*, in testing a plan to counteract bad management; and after all my other crops were sowed, I harrowed half a bushel of rye to the acre, not *in* but *on* land thus beat hard by the hoof.

It formed no part of *my plan* to have preceded this operation by deep coultering. That would have been too much like your *laborious farming.*

Plaster would cost money as well as time to sow it, and that also was entirely out of *my line.*

In this situation the field was left to shift for itself, except that I kept every thing off until the rye was ripe. The crop proved better than, under such circumstances, could be expected.

The field was also well covered with white and red clover, and what we call ribwort or narrow plantain, (I don't know its botanical name;) *but if it is good for any thing*, it must be an excellent grass for bad farmers, for it will grow in any place, and on any kind of land.

I intended to have prostrated the rye by running a harrow over it, (for I have no roller;) but how can it be expected I would take so much time and trouble? It would have covered the ground much better, it is true, and no doubt would have added greatly to its improvement; but I never have time to do any thing, however proper, that can *possibly be avoided;* and so I have contented myself with turning in my hogs first, and finally my cattle, horses, and every thing, to eat and tread it down, intending this fall and winter to turn in this cover of straw and grass, and plant corn next year.

The adjoining field, now in wheat, I will treat in the same way this fall, and prepare it for corn, to take its course the year after next; and as these fields are better adapted to corn than wheat, I mean to cultivate them afterwards alternately in corn, harrowing rye in after the corn is cut off, with some clover and timothy seed, (if I can muster energy and cash enough,) so as to have as heavy a cover as possible to tread, pasture down, and turn in during the fall and winter preceding the corn crop.

If I can discover a plan in this, or some such way, to improve our lands, without trouble or expense, indeed one which will *overpay* us at once for any little trouble or expense we may be at, it may enable *my class of farmers* to remain in the Ancient Dominion; otherwise (unless indeed you can reclaim us and our *lands too*) we must remove.

But seriously speaking, my dear sir, could you not cast this matter in your mind, and mature some simple plan of this kind, that might as an entering wedge, do some good, and strike the attention of that great class of farmers, who, from habit, &c. are incapable, at once, of any great efficient change?

I little expected, when I took up my pen, to trouble you with my *crude* and *unsatisfactory notions*, for they can't be call'ed *experiments*—much less to offer any thing to the public eye. This you will at once see is not my object.

Deciphering such pieces is a price you will have to pay. *We will have our money's worth out of you in some way or other.* I would be ashamed though to expect an answer, other than such hints, if this shall have suggested any, as you may deem it proper to give us in your paper.

By the way, you can also inform us in that way, whether you are acquainted with the rib-wort, and what you think of it as an improving grass. It has entirely taken possession of my farm, and I begin to entertain hopes it will prove a valuable grass: if it is not, there is no getting clear of it.

[If our correspondent has had "his money's worth out of us," we will take the liberty of getting it back by publishing his letter: his satire will amuse, if it does not indirectly help to benefit that class of farmers of which he professes to be an example.]—*Ed. Farmers' Register.*

Young Men's Department.

ON THE UTILITY OF KNOWLEDGE IN PREVENTING DISEASES AND FATAL ACCIDENTS.

The first class of accidents to which I shall advert, comprises those which have happened *from ignorance of the nature and properties of the different gases*, and of the noxious effects which some of them produce on the functions of animal life.

We have frequently read in newspapers and magazines, and some of us have witnessed such accidents as the following:—A man descends into a deep well, which has for some time been shut up. When he has gone down a considerable way, he suddenly lets go his hold of the rope or ladder by which he descends, and drops to the bottom in a state of insensibility, devoid of utterance, and unable to point out the cause of his disaster. Another hastily follows him, to ascertain the cause, and to afford him assistance; but by the time he arrives at the same depth, he shares the same fate. A third person, after some hesitation, descends with more cautious steps. But he soon begins to feel a certain degree of giddiness, and makes haste to ascend, or is drawn up by assistants. In the mean time, the unhappy persons at the bottom of the well are frequently left to remain so long in a state of suspended animation, that all means of restoration prove abortive; and the cause of the disaster remains a mystery, till some medical gentlemen, or other person of intelligence, be made acquainted with the circumstances of the accident. Similar accidents, owing to the same cause, have happened to persons who have incautiously descended into brewers' vats, or who have entered precipitately into wine cellars, and vaults which had been long shut up from the external air, and where the process of fermentation was going on: they have been suddenly struck down, as by a flash of lightning; and, in some instances, the vital spark has been completely extinguished. Many instances, too, could be produced, of workmen who have incautiously laid themselves down to sleep in the neighborhood of lime-kilns where they were employed, having, in a short time, slept the sleep of death. The burning of charcoal in close apartments has also proved fatal to many; more especially when they have retired to rest in such apartments, while the charcoal was burning, and before the rooms had received a thorough ventilation.

Numerous are the instances in which accidents have happened, in the circumstances now stated, and which are still frequently recurring: all which might have been prevented, had the following facts been generally known and attended to:—That there exists a certain species of air, termed *fixed air*, or *carbonic acid gas*, which instantly extinguishes flame, and is destructive to animal life; that it is found in considerable quantities in places which have been shut up from the external atmosphere—as in old wells, pits, caverns and close vaults; that it is copiously produced during the fermentation of liquors in brewers' vats, where it hovers above the surface of the liquor; in cellars where wine and malt liquors are kept; and by the burning of lime and charcoal; and that, being nearly twice as heavy as common air, it sinks to the bottom of the place where it is produced. The following plain hints are therefore all that is requisite to be attended to, in order to prevent the recurrence of such disasters. Previous to entering a well or pit which has been long secluded from the external air, let a lighted candle or taper be sent down; if it continues to burn at the bottom there is no danger, for air that will support flame, without an explosion, will also support animal life; but, should the taper be extinguished before it reaches the bottom, it would be attended with imminent danger, to venture down, till the foul air be expelled. The noxious air may be destroyed by throwing down a quantity of *quick-lime*, and gradually sprinkling it with water; for as the lime slakes, it will absorb the mephitic air, and a person may afterwards descend in safety. Where lime is not at hand, a bush, or such like bulky substance, may be let down and drawn up several times; or some buckets of water may be thrown into it, till the air be so purified that a lighted taper will continue to burn at the bottom. These precautionary hints will apply to all the other gases referred to, where this species of gas may happen to exist. To which I may also add, as another hint, that in every situation where fixed air is supposed to exist, it is more dangerous to sit or to lie down in such places, than to stand erect; for as this gas is the heaviest of all the gases, it occupies the lowest place; and therefore, a person lying on the ground may be suffocated by it, while another, standing at his side, would feel no injury, his mouth being raised above the stratum of the noxious fluid. I shall only remark further on this head, that several disorders have been contracted by persons sleeping under the branches of trees in the night-time, and in apartments where great quantities of fruits, or other vegetable matters, are kept—from ignorance of the fact, that during the night the leaves of trees, and all vegetable matters, perspire a deleterious air, which, when it has accumulated to a certain degree, may induce a variety of serious complaints, and sometimes prove fatal.

The injuries which are produced by the stroke of lightning, form another class of accidents which are frequently owing to ignorance. Such accidents are more numerous and fatal, even in our temperate climate, than is generally imagined. From an induction of a variety of facts of this kind, as stated in the public papers and other periodical works, in the year 1811, the author ascertained that more than twenty persons were killed by lightning, during the summer months of that year, or at the rate of a thousand persons every fifty years, within the limits of our island; besides the violent shocks experienced by others, which did not immediately prove fatal, and the damage occasioned to sheep and cattle, and to public and private edifices; and it is worthy of notice, that most of the individuals who were killed by the lightning, had either taken shelter under trees, or were in situations adjacent to bells or bell-wires. The experience of succeeding years proves that a similar number of disasters of this kind annually take place. It is, however, more than probable, that at least half the number of accidents arising from the same cause might have been averted, had the nature of lightning, and the laws which regulate its movements, been generally known. Seldom a year passes, but we are informed by the public prints of some person or other having been killed by lightning, when taking shelter under a large tree—of whole families having been struck down when crowding around a fireplace, during a thunder-storm—of one person having been struck when standing beside a bell-wire, and another while standing under a bell connected with the wire, or under a lustre hanging from the ceiling.

There can be little doubt, that a considerable number of such accidents would have been prevented had the following facts respecting the nature of lightning been extensively known:—That lightning is a fluid of the same nature, and is directed in its motions by the same laws which regulate the motions of the electric fluid in our common electrical machines; that it is attracted and conducted by trees, water, moisture, flame and all kinds of metallic substances; that it is most disposed to strike high and pointed objects; and that, therefore, it must be dangerous to remain connected with or in the immediate neighborhood of such objects when a thunder-cloud is passing near the earth.

Hence the following precautionary maxims have been deduced, by attending to which the personal accidents arising from thunder-storms might be, in a great measure, prevented. In the open air during a storm, rivers, pools and every mass of water, even the streamlets arising from a recent shower, should be avoided; because water, being an excellent conductor, might determine the course of an electrical discharge towards a person in contact with it, or in its immediate neighborhood. All high trees and similar elevated conductors should also be avoided, as they are in more danger, of being struck than objects on the ground; and, therefore, a person in contact with them exposes himself to imminent danger, should the course of the lightning lie in that direction. But, to take our station at the distance of thirty or forty paces from such objects, or at such a distance as may prevent us from being injured by the splinters of wood, should the tree be struck, is more secure than even in the midst of an open plain. Persons in a house not provided with thunder-rods, should avoid sitting near a chimney or fireplace, whether there be a fire in the grate or not. For when there is a fire in the grate, the flue contains the following conductors—flame, smoke, rarified air and soot. Even when there is no fire, the soot with which the flue is lined is a conductor; and from the superior height of the chimney-shaft above every other part of the building, it is more liable than any other part of the house to be struck with lightning. In a house, too, gilt mirrors or picture frames, lustres or burning candles, bell-wires, and all metallic substances, should be carefully avoided, as they afford so many points of attraction, which might determine the course of an electric discharge. The safest

position is in the middle of the room, if not near a lustre, a bell, or any thing hanging from the ceiling; and if we place the chair on which we sit on a bed or mattress, almost every possible danger may be avoided. Such are a few maxims easy to be recollected and put in practice, by attending to which not a few accidents from electrical explosions might be averted.

In the next place, *various accidents have happened from ignorance of certain plain mechanical principles.* For example, serious accidents have sometimes occured from the want of acquaintance with *the laws of motion.* Persons have heedlessly jumped out of moving vehicles, and got their legs and arms sprained or dislocated, and from one boat to another when both were in rapid motion, and run the risk of being either bruised, drenched or drowned. But had the effects of *compound motion* been generally known and attended to, in all those cases where it occurs, it would have prevented many of those accidents which have happened from persons rashly jumping out of carriages when in rapid motion, or attempting to jump from the top of a moving cylinder, in which cases they are always precipitated with violence, in a direction different from what they expected, from the obvious effects of a combination of forces. Boats and carriages have been sometimes overset by persons rising hastily when they were in danger of such accidents,—from ignorance of the principle, that the centre of gravity of the moving vehicle, by such a practice, is raised so as to endanger the line of direction, being thrown beyond the base, when the vehicle must, of course, be overturned; whereas had they clapped down to the bottom, they would have brought down the line of direction, and consequently the centre of gravity, farther within the base, so as to have prevented the accident and secured their safety.

Many affecting and fatal accidents have happened, and are frequently recurring, particularly to children, and females in the higher ranks of life, *from their clothes catching fire,* most of which might be prevented were the two following simple facts universally known and practically applied,—*that flame has a tendency to mount upwards; and that air is essentially requisite for supporting it.* When the clothes of females take fire, as the fire generally begins at the lower parts of their dress, so long as they continue in an upright posture, the flames, naturally ascending, and meeting with additional fuel as they rise, become more powerful in proportion; whereby the neck, the head, and other vital parts of the body are liable to be most injured; and, by running from one part of the room to another, or from one apartment to another, as is most frequently the case, the air, which is the fuel of fire, gains free access to every part of their apparel, and feeds the increasing flame. In such cases, the sufferer should instantly throw her clothes over her head, and roll or lie upon them, in order to prevent the ascent of the flames and the access of fresh air. When this cannot conveniently be effected, she may still avoid great agony, and save her life, by throwing herself at full length on the floor, and rolling herself thereon. Though this method may not, in every case, completely extinguish the flame, it will to a certainty retard its progress, and prevent fatal injury to the vital parts. When assistance is at hand, the by-standers should immediately wrap a carpet, a hearth-rug, a great-coat, or a blanket around the head and body of the sufferer, who should be laid in a recumbent position, which will prove a certain preventative from danger. During the year 1813, the author noted down more than ten instances, recorded in the public prints, of females who were burnt to death by their clothes catching fire, all of which might have been prevented, had the simple expedients now stated been resorted to, and promptly applied.

Pure air is as essentially requisite to the health and vigor of the animal system as wholesome food and drink. When contaminated by stagnation, by breathing, by fires or candles, it operates as a slow poison, and gradually undermines the human constitution; yet nothing is less attended to in the economy of health by the great majority of mankind. Because air is an invisible substance, and makes little impression on the organs of sense, they seem to act as if it had no existence. Hence we find, that no attention is paid by the lower orders of society to the proper ventilation of their apartments. In some cases, the windows of their houses are so fixed in the walls as to be incapable of being opened; and in other cases, where the windows are moveable, they are seldom opened, except by accident, for weeks and months together; and were it not that a door and a chimney are to be found in every habitable apartment, the air would be rendered in many instances absolutely unfit for respiration. Crowds of tailors, weavers, shoe-makers and other mechanics, employed in sedentary occupations, are frequently pent up in close, and sometimes damp apartments, from morning till evening, without ever thinking of opening their windows for a single half-hour for the admission of fresh air; and consequently, are continually breathing an atmosphere highly impregnated with the noxious gas emitted from the lungs, and the effluvia perspired from their bodies, which is most sensibly felt by its hot, suffocating smell, when a person from the open air enters into such apartments. The sallow complexion of such persons plainly indicates the enervating effects produced by the air they breathe; and although its pernicious effects may not be sensibly felt, it gradually preys upon their constitutions, and often produces incurable asthmas, fevers, consumptions, and other dangerous disorders, which are frequently imputed to other causes. Nothing is more easy than to open the windows of an apartment, and other apertures that communicate with the external air, at meal hours, when the room is empty, in order to expel the contaminated air, and admit the pure vital fluid. No medicine or restorative is cheaper or of more importance to health and vigor than pure atmospherical air; yet, because it costs nothing, it is little regarded. Hints and admonitions in reference to this point are seldom attended to; for ignorance is always proud and obstinate, and the inconveniences supposed in certain cases to flow from the practice of ventilating particular apartments are seldom attempted to be remedied. It is therefore, presumed, that were a knowledge of the nature of the atmosphere, of the ingredients that enter into its composition, of its indispensable necessity for the support and invigoration of animal life, of the circumstances by which it is deteriorated, and of the baneful effects which are produced by its contamination, more widely diffused, its use and importance would be more duly appreciated, and the disorders which flow from the circumstances now stated, effectually prevented.

Much benefit might also be produced, were *a knowledge of the means of restoring suspended animation,* in cases of drowning, strangulation, &c. generally disseminated. As prompt measures in such cases are absolutely necessary, many fatal effects have happened from the delay occasioned by medical assistance having been at a distance, which might have been prevented, had the proper means of resuscitation been known, and immediately resorted to by the persons present at such a juncture. Were the nature and importance of the function of *perspiration* generally known and attended to, it might likewise be the means of preventing those diseases and disasters which flow from making sudden transitions from heat to cold which are the origin of many fatal disorders among the laboring classes. If a man is thoroughly convinced that more than the one-half of what he eats and drinks is thrown off by insensible perspiration, he will at once see the importance of avoiding every practice and every circumstance which has a tendency to obstruct the operations of this important function.

The last example I shall mention, though not of the least importance, is the fatal effects produced by ignorance of *the proper mode of treating children during the first stages of infancy.* It is a fact deduced from the annual registers of the dead, that one half the number of children born, die under seven years of age. This extraordinary mortality is universally imputed, by medical writers, to wrong management during the first and second years of their infancy, and the practice of giving anodyne aromatic medicines. Instead of clothing infants in such a manner as to give free scope for the exercise of all the vital functions as soon as they are ushered into the world, the midwives and officious matrons frequently vie with each other to improve upon nature by attempting to model the head and to strengthen the limbs by the application of fillets, rollers, and swaddling bands of several yards in length; thus loading and binding them with clothes equal to their own weight to the manifest injury of the motions of their bowels, lungs, limbs, and other animal functions. Instead of covering the head with a thin single cap, and keeping the extremities in a moderate degree of warmth, an opposite course is most frequently pursued, which is supposed to be one among the many existing causes of hydrocephalus, or water in the brain. Instead of allowing the first milk that is secreted, which nature has endowed with a purgative quality, to stimulate the bowels, it is a common practice, immediately on the birth of a child, to administer a variety of purgative medicines in close succession, "as if," says a modern writer, "to prove that it has arrived in a world of physic and of evils." Instead of being exposed to the invigorating effects of pure air, and kept in a moderate degree of temperature, they are too frequently confined to a hot contaminated at-

mosphere, which relaxed their solids, impedes their respiration, and frequently induces fatal convulsions. There are but a few examples out of many which could be produced of the improper treatment of children, from which multitudes of painful complaints and dangerous disorders derive their origin. It is therefore reasonable to believe, that were general information on such topics extensively disseminated, and a more rational mode of nurture during the first years of infancy adopted, not only fatal disorders, but many subsequent diseases in life might either be wholly prevented, or, at least, greatly mitigated.—*Dick on Knowledge.*

TRANSFORMATIONS IN NATURE.

Numerous transformations take place in nature; indeed it may be said, that every thing in the physical world, at one period or another is metamorphorsed. The figure of objects continually varies; certain bodies pass successively through the three kingdoms of nature; and there are compound substances, which gradually become minerals, plants, insects, reptiles, fish, birds, quadrupeds, and man. Every year millions of bodies blend together, and are reduced to dust. Where are the flowers which during the spring and the summer, ornamented our fields and our gardens? One species has appeared, withered, and given place to others. The flowers of March, and the modest violet, after announcing by their presence the arrival of spring, have yielded their place to the tulip and the rose. In the room of these we have seen others, till all the flowers have fulfilled their design. The same holds good with regard to man. One generation shews itself, and another disappears. Every year thousands of human bodies return to the dust from whence they were taken; and of these evanescent bodies others more beautiful are formed. The salts and the oils of which they were composed dissolve in the earth; the more subtile particles are raised into the atmosphere by the sun's heat, and mixing there with other matters are dispersed in different directions by the winds, and fall down in rain and dew, sometimes in one place, and sometimes in another; whilst the grosser particles mix with the earth. The grass which is nourished by them grows up into long blades; and it is thus that the flesh of men, transformed into grass, serves as aliment to the flocks, whose wholesome milk is again converted to our own subsistence.

These continual transformations, thus operating in nature, are so many certain proofs that the Creator has designed that nothing should perish or be useless. The dust of flowers used in the fecundation of plants, is only a very small part of what each flower contains; and that the superabundant portion may not be lost, bees are created, which make use of it to form their honey. The earth daily presents us with new presents, and it would in the end be exhausted, if what it gives was not in some way or other returned again.

All organized bodies suffer decomposition, and are at last converted into earth. During this dissolution, their volatile parts rise into the air, and are dispersed in every direction. Thus the remains of animals are diffused through the air, as well as through the earth and the water. All these particles, so dispersed, unite together again in new organic bodies, which in their turn will undergo similar revolutions. And this circulation, and these continual metamorphoses, which commenced with the world, will only terminate with its dissolution.

The most remarkable transformation, or at least that which interests us the most, is that in which we are immediately concerned. We know that our body was not once composed, and will not be so in the end, of the same number of parts as it is when in its greatest perfection. Our body, when in our mother's womb, was extremely small; it became much larger when we were brought into the world, and since then has increased to fifteen or twenty times the bulk it then had; consequently blood, flesh, and other matters, supplied by the vegetable or animal kingdom, and which formerly did not belong to our body, have been since assimilated to it, and are become parts of ourselves. The daily necessity of eating proves that there is a continual waste of the parts of which we are composed, and that this loss must be repaired by alimentary matter. Many parts insensibly evaporate; for since the experiments which a certain great physician made upon himself, it is ascertained, that of eight pounds of nourishment necessary to support a healthy man in one day, only the fiftieth part is converted into his own substance; all the rest passing off by perspiration and other excretions. Hence also it may be inferred, that in ten years there will not remain many of the same particles that now constitute our bodies. And at length, when they shall have passed through all their different changes, they will be converted into dust, till the blessed day of the resurrection, when they will undergo that happy and final revolution that will place them in a state of eternal rest.—*Sturm.*

PRINCIPLES NECESSARY TO BE OBSERVED BY THOSE YOUNG MEN WHO ARE NOT YET IN BUSINESS FOR THEMSELVES.

Every young man should remember that the character which he is to sustain, and which is to *sustain him*, when he shall be in business for himself, is to be formed while he is yet in a subordinate station. This observation holds true, not only with respect to the reputation which he is to possess among men, but also with regard to his real characteristics. The habits, principles, and manners of the *youth*, will be essentially those of the *man;* and as it is our object to place these on a solid basis, and form them in a manner suited to the real exigencies of life, we shall express ourselves plainly, going directly to the point; and calling the vices and virtues by their right names. We begin by pointing out some practices which are to be avoided: and as the foundation of all that is beautiful in character is ingenuousness, we shall first bear our testimony against

Lying.—To lie to the prejudice of others, argues malice and villany: to lie in excuse of ourselves, guilt and cowardice: both ways, a design to elude with false representations of things, and advantage ourselves by the deceit. Now, however artificially we may carry on this infamous practice for a while, in the end it is always discovered; and it is hardly to be imagined what infinite contempt is the consequence. Nay, the more plausibly we have conducted our fallacies before, the more severely shall we be censured afterwards. From that moment we lose all trust, all credit, all society; for all men avoid a liar as a common enemy; truth itself in his mouth loses its dignity, being always suspected, and often disbelieved.

If, therefore, you should ever unwarily fall into an offence, never seek to cover it over with a lie; for the last doubles the former, and each makes the other more inexcusable; whereas, what is modestly acknowledged is easily forgiven, and the very confession of a small tresspass establishes an opinion that we are innocent of a greater.

Dishonesty.—But truth in speech must likewise be accompanied by integrity in all your dealings; for it is as impossible for a dishonest person to be a good agent, as it is for a madman, or an idiot, to govern himself or others by the laws of common sense. Dare not, therefore, allow yourself even to wish to convert the property of another to your own use, more especially where it is committed to your charge; for breach of trust is as heinous an aggravation of theft, as pretended friendship is of murder. If, therefore, you should be lucky in your frauds, and escape without being punished and detected, you will nevertheless stand self-condemned, be ashamed to trust yourself with your own thoughts, and wear in your very countenance both the consciousness of guilt and dread of a discovery; whereas innocence looks always upward, meets the most inquisitive and suspicious eye, and stands undaunted before God and man. On the other hand, if ever your knaveries come to light, (to say nothing of the penalties of the law,) with what shame and confusion of face must you appear before those you have wronged! and with what grief of heart must your friends and relations be made eye or ear witness of your disgrace! Nor is this all; for, even supposing you should be convinced of your folly, and sincerely abhor it for the future, you must nevertheless be always liable to suspicion, and others will have the boldness to pilfer, on the presumption that you will be understood to be the thief.

Fidelity.—There is still another sort of fidelity, which may be called affection, as the other is of action, being almost of as much consequence, too, and what never fails to endear you to those in whose favor it is employed; we mean that of defending their reputations, not only negatively, by avoiding all reproachful, indecent or even familiar terms in speaking of them, but positively, by endeavoring at all times to vindicate them from the open aspersions and base insinuations of others.

That which makes us discontented with our own condition, is the false and exaggerated estimate we are apt to form of the happiness of others.—*Fr.*

The rust of the mind (idleness) is the blight of genius.—*Seneca.*

THE CULTIVATOR—APRIL, 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE WHEAT INSECT.

The wheat crop has been more or less injured in the northern states, for some years, by small maggots which prey upon the kernel while growing in the field, and before the grain has become hard. In some instances nearly the entire crop has been destroyed, while in other cases the injury has only been partial. It has been generally believed, that the maggots have proceeded from a fly, which deposites its eggs while the wheat is in blossom, or soon after. It has also been remarked, that the fly is seen but for a few days; and that if, during its presence, the wheat ear has either not burst in the sheath, or is far advanced towards maturity, no evil is experienced from the insect. In some instances late sown grain has escaped most, and in other cases it has suffered most. No general rule upon this point can be laid down. Nor has any preventive of the evil been published among us. The most plausible recommendation that we have heard mentioned, is to strew fresh slaked lime over the field soon after the grain is out of blossom. This is recommended to be done early in the morning, while the dew is upon the grain. At this time the maggots are small and tender, and the causticity of the lime, brought in contact with them by the dew, it is thought will destroy them. If the field is laid in ridges, or narrow lands, the lime may be thrown from the middle or water furrows without prejudice to the grain. Though this is mere theory, we think it worth a trial; and we beg to be apprized of the result of any trial that may be made upon this suggestion, be it favorable or otherwise.

A very sensible writer in the Penny Magazine, F. Bauer, has written several communications upon the diseases of wheat and other grain, which contain the result of close and continued examination, and are accompanied with drawings, showing the appearance of the diseased grain, and of the fungi and insects which cause these diseases. He considers the smut of grain a parasitic plant, or fungus, whose seeds are so minute as to pass from the seed grain in the soil, with the ascending sap, to the ear of the grain, where it grows and produces smutty grain. His preventive is to steep the seed in strong lime-water, which he supposes kills the seed of the smut. There is no doubt that the steeping and liming seed wheat is a sure remedy against smut. Thousands of trials, made in this country and in Europe, leave not a doubt upon this subject.

Mr. Bauer's last communication is on what he calls the *grain worm*, (*vibrio tritici*,) and is accompanied with drawings of the diseased grain, and of the insects as they appeared under a highly magnifying power. The disease is known in England under the different names of *ear-cockle*, *brown-purple* and *burnt-corn*. Mr. B.'s experiments and observations were commenced in 1807, and were continued down to 1823, at which time he communicated a detailed account of them to the Royal Society, which may be seen in the Philosophical Transactions of the latter year. We do not feel competent to decide, whether the *grain worms* described by Mr. Bauer are the same as those which attack our wheat, but we are inclined to the opinion that they are identical. We subjoin an extract from Mr. B.'s communication, which cannot fail to interest the farmer as well as the naturalist.

"Being fully convinced that the worms or their eggs, like the seeds of the pepper-brand and dust-brand, [smut,] must be absorbed by the germinating seed corn, and propelled by the circulating sap into the young germens, and reflecting that I had successfully inoculated the wheat grains with the fungi, I determined to try the same experiment with the worms; accordingly I selected a sufficient number of sound wheat grains, and extracting a small portion of the worms from the cavities of the infected grains, (which had been previously soaked in water about an hour,) and placing some in the grooves on the posterior sides of the sound grain, I left them for some days to get dry, and planted them in the ground on the 7th October, 1807. At the same time I planted some sound wheat grains in separate holes, about two inches deep, and in each hole two or three infected grains also. About the middle of November most of the seeds had come up, and from time to time I took some of these young plants for examination, but did not perceive any effect of the inoculation until the 3d of December, when, out of nine plants, five appeared to be affected with worms. In the first plant, after carefully splitting the young plant from the root upwards, I found in the unorganized substance, between the radicle and plumula, three young worms, very lively, but not much larger than those with which the seed corn was inoculated; in another plant I found a full sized worm, but no eggs about it; in the third plant I found a still larger worm than the last, but in dividing the stem I had cut the worm in two, and it soon died; it seemed to be full of eggs; in the other two plants I found some worms quite young, and some half grown; but on the other four plants the inoculation had no effect. The fact that at such an early stage of the vegetation of these inoculated seed grains, such large worms were found, confirms my first supposition, that it requires several generations of these worms to introduce their eggs into the young germens; the large worms found in the substance of the young stem were undoubtedly some of the worms with which the seed corn was inoculated, for they were on the point of laying their eggs in that stage, and these eggs being again propelled by the rising sap a stage farther, there come to maturity, and then lay their eggs, and thus progressively reach the elementary substance of the ear, where they are finally deposited in the then forming grain; the whole progress probably requires three or four reproductions."

Mr. B. then describes many subsequent examinations of infected plants, and continues:

"My experiments for resuscitating the grain worms, I have repeated almost every succeeding year to this day, and always with the same success; but I find that the longer the specimens are kept dry, the grains require to lay in water a greater length of time before the worms will recover; and that after the same specimens had been kept dry *six years and one month*, the worms were all really dead.

"That this disease is contagious, is sufficiently proved by the fact, that it can at pleasure be successfully inoculated on the soundest seed corn. The infection, however, is not so generally nor so readily communicated as the disease occasioned by the fungi of the smut balls or dust-brand, a few infected ears of which are capable of contaminating and infecting the whole contents of a barn. Grains infected with these worms having no embryo, cannot vegetate and produce again diseased grains of themselves, but can only communicate the infection by coming in contact with the germinating seed corn in the soil, by the moisture of which the worms are revived and extricate themselves, which I have so often observed they do when kept some time in water.

"Steeping the seed corn in lime-water, in the same manner as advised for preventing the diseases occasioned by the fungi, is the most effectual method of preventing the spreading of this disease. I have repeated the experiment by inoculating, very strongly, sound wheat grains with the worms, and afterwards steeping them in lime-water, and the infection was always prevented; I have also steeped some sound wheat grains in lime-water, and after having kept them in a dry state for some days, I inoculated them strongly with the worms, but on examining the plants, not one case of infection occurred. From these facts it is evident, that properly steeping the seed-corn in lime-water before sowing, is a sure preventive of the disease occasioned by grain worms."

THE ORCHARD.

The most usual practice has been, so far as our observation has extended, to prune fruit trees in March or April; but it has been recommended by some to omit this work till May, till after the leaves are out; and by others still further to postpone it till the last of June or beginning of July. Against March and April pruning it is urged, that the wood, where cut, is liable to crack, through the influence of the drying winds of those months, and being unprotected by foliage, that the sap is apt to exude and waste, and to corrode the lips of the wound; and that, *at this season*, the efforts of nature to heal the wounded parts are feeble. May pruning has been objected to for the reason, that as at this time all the organs of the plant are in active operation, and the growth more vigorous than in any month of the year, pruning cannot but be prejudicial. The sap vessels are at this time full, and the sap pushing with great force to the extremities; and if the branches are materially diminished, the sap will force itself out near where its flow has been stopped, in numerous shoots, useless for fruit, and unsightly to the eye. Those who have pruned at this season can judge what force there is in these objections. Most of our trees, and particularly fruit trees, have two periods of growth in a season, the first principally in May or June, and the other towards autumn. Between these two periods, their growth

is in a manner quiescent. This is declared by many to be the best period for pruning—because the second growth suffices to cover the lips of the wound, or, when small, the wound itself, with new wood and bark; and, in the second place, because the volume and force of the sap are then so much diminished, that few shoots or spray are thrown out. We have tried the different seasons, and are of the opinion, that the last mentioned time has a decided preference. For three successive years, we have pruned our orchard after cutting an early crop of grass, say the middle of July, and have witnessed none of the evils which have resulted from autumn and spring pruning.

We recommend to the cautious orchardist to do as we have done: try the three methods, and hold fast to that which does best. Experience is the best school in which to gain instruction, and it is the only school in which most of us are willing to learn.

We will give but three rules in regard to the operation of pruning an orchard, and they will be short ones.

Prune annually. If judiciously done, none but small branches will be required to be cut, and the wounds of those will soon heal.

Make a clean cut, and pare smooth, with a sharp knife, the edges of the wound. This will greatly facilitate the healing process, and preserve the tree from decay.

When the habit of the tree will allow, take out the leading shoot, at the height where you design to have the branches spread. A horizontal branch will produce more fruit than an upright one.

The best application that we have tried, (and we have used it to advantage six or seven years,) to kill bark lice upon the apple tree, to destroy larvæ of other insects, and to give a clean, healthy appearance to the tree itself, is a *strong* ley, made of wood ashes or potash. It is applied to the bole or trunk of the tree, and branches if necessary, with a brush, nailed or tied to a stick a yard or more in length. The most suitable time to make the application is between the middle and last of May.

There are advantages and disadvantages in tilling an orchard. In tilled ground, trees are the most vigorous and thrifty; and it seems to be in a measure necessary to plough a few years to give the young trees a start. Yet even at this period, great care is required not to cut the roots with the plough. But when the trees have acquired six or eight years' growth, and the roots become extended, still greater precaution is necessary, or the injury becomes serious. It is not altogether the large roots that are so liable to be cut, for these are often below the plough, but the innumerable fibres that spread in every direction, which escape the ploughman's notice, but which are literally the mouths that convey food to the plant. Our practice has been, when an orchard is to be ploughed, to proceed, first to dig the ground superficially with the spade, about the tree, two or three feet in breadth, and as many yards lengthwise of the furrow, so that there shall be no balk, and to run the plough shallow near the dug part: and where the orchard is in grass, to dig circles round the trees after harvest, both to facilitate growth and to prevent injury, in winter, from moles. There is no less caution necessary in using the spade than the plough, to preserve the roots entire. It is a good practice to cut the grass close with a hoe, and then to strew rotten chip dung, if mixed with a little lime the better, about the tree.

THE GARDEN.

If a snug well kept kitchen garden is not an infallible proof of thrift, when seen near a farm-house, it is a pretty certain indication of comfort and good sense. It shows that the owner is well to live, and intends to live well, so far as his labor and his lands can conduce to good living: for it will not be denied, that the farm and the garden *may* be made to produce, not only the substantials, but a great many of the luxuries of life—we mean those luxuries which, while they are grateful to the senses, neither pall the appetite, vitiate the taste, impair the health, nor corrupt the morals of those who partake of them. Some consider the productions of the garden as constituting a necessary part of human food. So the man of the forest would tell us, that *bread* is an unnecessary article of food—the Abyssinian, that it is unnecessary to *cook* our meat—and many of the inhabitants of Asia would insist, that it is impious to indulge in the use of animal food at all. But as none of these opinions are suited to our age and country, there is no need of combatting them. The pleasures and benefits of a garden are so manifest, that none who have once enjoyed them are willing voluntarily to do without them. To have a succession of delicious fruits, plucked at maturity from the trees and vines which one has planted and reared;—and to partake daily of fresh gathered vegetables from one's garden, the product of his labor, promotive alike of health and pleasure, are no mean gratifications; and yet they are privileges, we are too sorry to say, which, though all *can* enjoy, but few, comparatively, at present, *do* participate in.

Let us enumerate some of the good things, conducive alike to health and innocent gratification, which a garden may be made to produce with very little expense. Our perennial products, which require very little care after they are once established. We will name, of fruits, the strawberry, (for these will be smothered by the grass on a well conducted farm,) the currant, gooseberry, plum, pear, quince, grape, and, in situations where they will thrive, the apricot and peach. But of fruits, we would have none but the best sorts; for the best are as cheap as the worst, are as easily cultivated, and are infinitely more healthy and grateful. These, if well selected, will give a succession of fruit from June to November, and in a preserved state during the year. Plants to begin with will cost from three to five dollars. They may be multiplied, by grafting, budding, &c. by the boys or men of the family, without any expense. The trees should be so arranged as to shade as little as possible the grounds that are to be tilled. Half a dozen roots of the pie-plant (rhubarb) will furnish abundant materials for pies and tarts, little if any inferior to the gooseberry, from April to July, or until the fruit is sufficiently advanced to supply its place. These should be planted two feet apart in good soil. A bed of forty by three and a half feet will supply the table with delicious asparagus, during a part of April, and the whole of May and June, if kept in good order. For this the ground should be dug deep and made rich. The seed, which will cost a shilling, should be sown in drills ten or twelve inches apart, about the first of May; the bed should be kept free from weeds, and the ground forked in the spring. The third year it will be fit to cut. Or, roots may be bought at fifty cents the hundred, which will give a crop the second year. Plant them six inches apart in the drills. About two hundred and fifty plants will fill a bed of the given dimensions. Among the perennials, we may also class some medicinal plants and sweet herbs which are useful and necessary in the economy of a family, such as sage, thyme, hyssop, bam, rue, tanzy, wormwood, &c. which it requires ten times the labor to beg from more provident neighbors that it does to raise in our garden. The annual products, which go towards subsisting a family, and which are seldom produced but in the garden, are numerous, as the onion, beet, carrot, parsnip, cabbage, peas, beans, pot herbs, saliads, radishes, squash, cucumber, melon, &c. Some of these are in use most of the season, and most of them afford valuable winter stores.

These productions of the garden which we have named, and the list might be greatly extended, are all useful in the economy of a family, they afford a grateful variety, and tend to lessen, in no inconsiderable degree, the quantity of more solid and expensive food, which would be required without them—and yet they may all be produced in sufficient quantities for an ordinary family, upon a quarter of an acre of ground, and without seriously abstracting from the ordinary labors of the farm. A garden is truly a matter of economy in a pecuniary point of view; but when we add to this consideration, the comfort and pleasure which it affords, we are persuaded we are in the line of duty, in commending the subject to the particular consideration of our readers.

It is not our purpose at present to prescribe rules for laying out or managing a garden; yet we cannot forbear to suggest, that the first step should be, to enclose it with a good substantial fence, and to keep that at all times in repair, so as effectually to exclude hoof and hog. We have said nothing of the sale of the surplus products of a garden, although hardly any location is without a market for such products; nor have we noticed the ornamental department; because the wife or daughters will see to this—they *will* have their shrubbery and their flower border.

ON IMPROVED FARMING.

The method of farming that has heretofore been generally adopted in this country, was to cultivate that kind of crop which gave temporarily the most profitable returns, utterly regardless whether, by a succession of exhausting crops, the soil became impoverished or not. Indeed, it was not till of late years even thought necessary to aid its fertility by such a thing as a rotation of crops, or the regu-

lar application of manures. The manner was, to crop it as long as a particular kind of grain could be made to grow, in a given field, and when every particle of fertility was at length extracted from the soil that lot was thrown away as worthless. A new clearing was made, and then the same bad practice was continued. In the south, they complain of the barrenness of their land; that it yields scarcely a tenth of the produce it did when it first came under culture; that they can now raise but a moiety of the quantity of cotton, tobacco, wheat or corn, per acre, they did formerly; that the farming population are in consequence impoverished, and they are now obliged to sell their farms for a trifle; and to improve their circumstances, many are ready to move off to the west, in quest of a more productive soil. But suppose these persons effect their object—sell their exhausted farms, and go to the most fertile regions of the world—let me ask, how long will it be before these same people must again move from the same cause that made a first removal necessary, viz. that they have once more worn out their lands? No matter how fertile land is, you may, by raising crop after crop from it, if you do not in some way manure it, make it in time utterly worthless. In that respect it is like your ox,—no matter how vigorous, well-conditioned and fit for labor he may be, if you work him to excess, and give him scanty fare, he becomes at length broken down and valueless. But it is not in the south alone where this species of bad management has prevailed: The north comes in for her full share; and, strange as it may appear, for all intelligent farmers now acknowledge the necessity for occasional manuring, and a judicious rotation of crops, this suicidal practice still obtains upon some of what is the finest land in New-York.

The western part of this state is noted for raising large crops of wheat, and we often hear farmers from that portion of it boast of the wheat crops they have successively taken from particular fields. This for a time may do very well, but according to every principle of correct farming, it is miserable management; and although the occupant now is rich, he will leave a legacy of an exhausted farm to his son or successor. There is no such thing as an inexhaustible soil. It is contrary to every principle of reason and experience.—The valley of Egypt, from the time of Moses, has been celebrated for its fertility, but remember even in his time it already required the overflowing waters of the Nile to make it produce its usual crops. If a dry season intervened, and the waters, the cause in part of its fertility, did not rise to their usual height, that season was one of suffering for want of bread. The farming history of western New-York, as to the fertility of the soil, has been the history of every portion of the state, as it was successively cleared of its timber, and put to the purposes of cultivation. What is now called the old settled part of the state was formerly thought the best of land; for a succession of years wheat crops were raised from it until it became exhausted, and wheat could be raised no more. This it took years to accomplish; but no matter how rich the virgin soil, it was ultimately effected, and what was once thought the finest land in the world, was at last, by this miserable management, made almost worthless.

Emigration to our western country owes much to this circumstance, and many of its present possessors must follow the example of our predecessors and former neighbors, and remove, or adopt some other mode of farming, by which the errors of former years can be remedied. We have now found out, that it requires all of the intelligence, judgment and skill that we can command, to bring back in part, our farms to the state of fertility which nature gave them; and to accomplish this, we feel the necessity of the most judicious and systematic management. To begin, we find ourselves deficient in all the requisite information upon which a correct judgment can alone be be formed;—we find that we ought to know the nature of the soil we cultivate, what plants grow the most vigorously in it, and what artificial aid we can give to make it the most productive. But are we competent to this? Can we analyze the different soils without a due course of education? Can we know what plants do best upon particular locations without we understand their nature? Can we provide the best and cheapest food for them, until we learn what enters into their combination, what they take up and what they leave behind? The sciences unquestionably throw great light upon these as yet to us hidden laws of nature, and until farmers derive collateral aid from them we can only follow in the footsteps of our fathers. They, however, had advantages which we do not possess; they had a virgin soil to repay them for their agricultural labor.—We have the exhausted fields which we are endeavoring to restore to fertility, and at the same time provide bread for our families.

Thus far we have met with some little success, for we see indications that our efforts have not gone entirely unrewarded; that our land begins to yield more bountifully, and that it can be made capable to do much more. It is not long since it was a general observation, that land did not yield over three per cent interest; and if we could not believe the veracity of those who made the assertion, we had at least numbers to endorse it. It was unquestionably true, land at that time was not as productive a source of revenue as money at interest. Could the price of land at that time be otherwise than low, when it did not yield a sufficient return for the investment? No man bought it unless he was by occupation a farmer, or compelled to take it in payment of a debt. But since a better, and of course a more productive system of farming partially obtained, land has risen in price. It is more sought after, and it is becoming more fashionable for gentlemen to cultivate small farms. Formerly grain was almost the only source of revenue derived from a farm, and, as the most of these had become impoverished by bad husbandry, the quantity raised was of course small, and the per centage profit bore no proportion to its first cost. This management was in time found very unprofitable. A different system has been introduced, and the good effects from it are already decisive. To stock your farm, feed up your hay, straw and offal, and thus realize two profits—the first upon the increased value of your stock, the second from the sale of your grain. By this practice you are enabled to make a much larger quantity of manure; and from this, again, not only raise an increased quantity of grain, but enrich your fields, and thus extend the number of your stock. Our best farmers adopt this practice, and the success that has attended it in the county of Dutchess is the strongest proof of its correctness.

It may be inquired, however, what kind of stock is the most profitable. That must depend in a great measure upon the adaptation of the soil to raise natural or artificial grasses, and the nearness of the farm to a good market. On some, a dairy may do best; on some the fattening of cattle; on others, the raising of sheep: but the last is attended with the least trouble. The market for the carcase or the wool is almost always at hand, and upon the whole, particularly in the interior, generally the most profitable. A farm costing $30 per acre, and adapted to the raising of grass as well as grain, will support sheep enough to pay the interest on the investment, and all expenses, besides raising about as much grain as if there were no sheep upon it. This is not idle assertion. We have abundant evidence of the fact, and can cite chapter and verse to substantiate it. It is this practice that makes the Dutchess county land sell for $70 per acre, while other land, equally as good, but not so well cultivated, and whose capabilities have not been so well ascertained, will not sell for half the price. A farm cultivated in this way is constantly improving. The hay raised on it is not sold, but it is fed to the sheep, who in return give a large quantity of manure, so that as much grain as was formerly raised upon the whole, is, by this course of tillage, grown upon half or one third of the ground. Of this method of farming, we have had some experience, and every ton of hay fed out upon a farm to this kind of stock, is worth to the farmer at least $20—how unprofitable then for them, for want of this stock, to sell their hay for $5 per ton, for in this way they meet with a double loss: they do not get the full value of their hay, and the manure it would produce from their not feeding it, is an entire loss. The growing of wool in this country cannot in many years be overdone. There are large quantities annually imported, and must be for some time to come. We have over thirteen millions of inhabitants, and raise but about fifty millions of pounds of wool, which is not four pounds to each inhabitant. A much larger quantity than this is required for our present population, and with all our facilities for keeping sheep, the low price of our lands, and a climate that seems to suit their constitution, we ought to make it an article of exportation, and not of importation.

Salt to Farm Stock.—That salt is beneficial to domestic animals, seems to be universally admitted, by the general practice of giving it to them at shorter or longer intervals. We have abundant evidence that it tends to preserve health, and even to restore it in many cases, when it has been impaired. Its effects upon the animal system are believed to be pretty uniform upon man and beast. What then is the form in which *we* prefer it? With our daily food.

Why is it not then equally grateful and beneficial, if administered daily to our cattle? If at all times accessible they will never take it to excess; at least I have never known them to do so in twelve years experience: for during this period I have had troughs with salt in them constantly under my sheds, to which the stock have had daily access;—and no disease, not even the black tongue, has shown itself among them. Gen. Barnum, of Vergennes, I think has stated, that salt, with an occasional admixture of salt petre, is not only a preventive of the latter disease, but a cure where it has commenced its attack.

To divest milk and butter of the taste of turnips, cabbage, &c. upon which cows have fed, put into each pail of milk, when fresh drawn from the cows, one pint of boiling water. The heat of the water dispels the odor of the turnip, which becomes volatile as the temperature of the milk is increased. This has been practised and proved to be effectual, by the writer, in cases where cows have been fed two or three months in the year upon Swedish turnips. Marshall states that hot water is equally effectual, when thus applied, in removing the taste of wild onions and leeks.

Mildew.—When wheat becomes badly mildewed, the grain ceases to derive further nourishment from the root—the ascent of the sap to the head is wholly obstructed; and the sooner it is cut the better. Although the grain will be more or less shrivelled, it will nevertheless retain a good color.

The Hoven in Cattle, is caused by their eating too abundantly of green succulent food, as clover, turnips, &c. and under bad management, often proves fatal. A pint of weak ley has been found to give relief. The Norfolk practice, according to Marshall, is to give a beast salt and water; and if this fails, a horn of salt and grease, warm. The Annals of Agriculture directs, as a specific cure, even in the most desperate cases, the following dose: three-quarters of a pint of olive oil, and one pint of melted butter or hog's lard, to be administered by means of a horn or bottle. As a preventive, cattle should not be turned into rank clover while the dew is upon it, nor suffered to continue more than an hour or two in it at a time, when uncropped.

Economy of Manure.—Cattle fattened upon turnips and straw, or hay, are estimated in England to produce eleven and three-fourth tons manure each. *See Bordley.* If every horse and bullock upon our farms produced a like quantity, and the whole was judiciously applied, our crops would be increased at least ten per cent—manures are the means of substantial wealth to the farmer; but to be productive, they must be regularly deposited in the soil.

Manure —Arthur Young took five equal portions of a field, one portion of which he manured with dry cut straw; a second with straw soaked five hours in fresh urine; a third with straw soaked in like manner fifteen hours; a fourth with straw soaked three days; and to the fifth portion he applied nothing. The whole was tilled alike, and sown with grain. The product, in grain, of the first was thirty-nine, of the second fifty, of the third sixty-three, of the fourth one hundred and twenty-six, and of the undunged portion nine. In weight of grain and straw, the product of the several portions, in the order above named, were found to be, 100, 120, 130, 300, and 48. This experiment affords a pretty conclusive demonstration of the value of vegetable matter as food for plants, and particularly of the fertility imparted by the urine of animals, which latter, to us, is generally lost to all useful purposes. It indicates the propriety of so constructing our cattle yards and stable floorings as to concentrate this liquid; and, where there is no cistern to retain it, of applying straw and other litter to absorb it ere it is wasted. Another fact is worth noting: the rotting process took place wholly in the soil;—the fertility was induced by long manure, and the liquids which it held,—and not by muck.

Gypsum.—An interesting series of experiments made with gypsum, by one of the most intelligent and observing farmers of our country, will be found under our miscellaneous head. This mineral effects wonders upon certain soils and upon some crops, while upon other soils and crops it seems wholly inoperative. It is only by a course of careful experiments, like that which we copy, that we can learn to apply it with judgment and economy.

G. W. in the American Farmer, vol. iii, p. 413, states, that he doubles his corn crop, by putting into each hill, after the seed is dropped, a clam shell full of two parts of leached ashes, and one of plaster. Although this sounds much like the poetry or fiction of agriculture, it will cost but little to try it; and if the benefit is a tenth part of what is stated, the cost of the experiment will be amply remunerated.

Alternate husbandry, has been a principal means of converting one of the poorest counties of England, the county of Norfolk, into one of the most productive and wealthy. Most of this county possesses a sandy soil. Sixty years ago summer fallows, according to Young, were common there, and fields were left in grass three years. At the close of the last century, according to the same writer, no such things as summer fallows were known, and grass was left but two years. The number of horses was lessened; ploughings were not so frequent, often but one for barley; and some trusted to mere scarifying, and succeeded well. This change of system had the effect to increase the product one-quarter and one-third. The same system is coming into operation upon our sandy soils, and with equal if not greater advantage.

AGRICULTURAL SCHOOL.

The joint committee of the Senate and Assembly have *reported* a bill for establishing an Agricultural School. As this bill *may be* discussed, the following account of a visit to an agricultural school in Switzerland, the first we believe ever established, cannot be considered devoid of interest. We copy it from the October number of the Penny Magazine.

In the month of August, 1832, I travelled into Switzerland for the purpose of making myself acquainted with the schools and institutions at Hofwyl. Situated about three leagues from the picturesque capital of Berne, amidst a beautiful scenery, composed of a cultivated vale, the Jura ridge of mountains, a pine forest, a small lake, and the glaciers of the Bernese Alps, stand the extensive buildings of the establishment, surrounded by about two hundred and fifty acres of farm land. Upon my first arrival, before I could obtain an opportunity of presenting my letters to the benevolent founder, I wandered about in various directions,—all was business and activity. Here was a troop of lads cutting the ripened corn, while another troop was engaged in conducting it to the barns. Here was the forge in activity, and there some little gardners performing various operations in small plots of ground that were portioned out; here were a group of little girls gleaning, there others carrying water, most of them singing while thus employed. But my attention was peculiarly arrested by about one hundred men, who in a large open building, erected in a recess of the garden, appeared to be engaged like boys in a school-room; over the entrance was inscribed this motto, "The Hope of their Country."

I was at last fortunate enough to be admitted into the study of M. de Fellenberg,—a man somewhat advanced in years, with a countenance beaming with intelligence and kindness. De Fellenberg was, by birth, one of the ancient aristocracy of the country, and in possession of the hereditary property of his family. He determined upon devoting his fortune and the labor of a life, in the endeavor to effect the regeneration of his native land, by the means of education. "I will infuse good habits and principles into the children," said he, "for in twenty short years these children will be the men, giving the tone and the manners to the nation." For thirty-two years has he pursued his steady course, increasing in influence, and extending his establishment as his scheme grew upon him, until it has become what he described to me. "This," said he, pointing to a large building, "is the institute for the boys of the higher classes. Here are their dining-rooms;—arranged on each side of yonder galleries are their dormitories. Here you see their gardens, their museum, their work-shops, their school-rooms; here their gymnasium, where they exercise themselves in wet weather; here their stream of running water where they bathe every day: study is their employment, bodily labor their recreation,—but bodily exertion I insist upon. There is no health, no vigor of mind, no virtue without it. Those persons grown to manhood, who are mixing with the boys, are placed by me to observe every action, and catch every expression. My grand object is to comprehend thoroughly the character of my pupils, in order that I may work more efficaciously upon them. These persons are by no means considered as spies by the boys; they are their companions. At Hofwyl all that is not in itself wrong is permitted. I never like to forbid a thing when I am unable to assign a reason for doing so: it creates a confusion in young minds with regard to principle, a thing most dangerous to their future hap-

piness. We have no boundary mark, yet my boys stay at home: we interfere not with their pleasures, yet they cling to their duty.

"Within this enclosure is my eldest daughter's poor school for girls. She has about a hundred under her direction, who are fed and clothed by the establishment. To these she devotes her entire time. They learn all that in after-life will be of service to them:—to clean the house,—to cultivate the garden,—to sew,—to make all those little necessaries which are of so much importance in the cottage; to read, to sing,—to be cheerful, and to be happy. Unless our women be brought up in modesty, and with industrious and religious habits, it is in vain that we educate the men. It is they who keep the character of men in its proper elevation.

"Here is my school for the middling classes,—here all instruction has reference to practical purposes. Man was born to have dominion over the earth, and to subdue it, but it is by the intellect alone that he can do so. His unassisted strength, what is it? To conquer Nature he must understand her. Look in here, and you will see the laboratory of the chemist, and the lever and the pulley of the mechanic.

"In these two buildings are my poor school for boys, who are boarded and clothed by the establishment. And well they earn their maintenance, for the little fellows work ten hours a-day in the summer; and the expense that I incur in their behalf is nearly repaid by their exertions. They study for two hours each day, and this I consider sufficient. The case here is the reverse of the Institute, for bodily exertion is the labor and study the recreation. The habits I bring them up with are those which I desire should continue with them through life; they consequently have reference to their probable position in society. The habit of continued study would ill-become a person destined to gain his livelihood by his hand. Although there are now one hundred boys assembled here, mine were but small beginnings. I had but one pupil at first. It was long before I could find a master in whom I could confide. Do you observe those little patches of garden ground? Each poor lad has one to himself; and the produce belongs exclusively to him. They usually dispose of it to the establishment, which either pays them the money at the time or lodges it for them in a little bank I have founded. Many of them have very considerable sums there. It is here that they obtain a habit of passing the greater portion of their time in continued and patient labor; they become acquainted with the value of labor by the produce of their little gardens. The instruction that I give them, although somewhat more elevated than what is generally obtained by persons of their rank in life, is directed to the rendering perfect the senses and reflection,—to make them better practical men; drawing, the sciences of arithmetic and geometry, a useful selection from the other sciences, all taught in the most unostentatious manner: the history of their native country, and an acquaintance with the different natural objects around them, together with music, form the extent of their literary instructions.

"Religion is inculcated in every way. Public prayer, both at church and at school, is regularly performed in common with the schools of other countries. Besides this, these poor lads are taught to see the Creator in his works. When their admiration is roused by a natural object, they are accustomed to direct their thoughts to its Maker.

"But here," said my venerable companion, "is the engine upon which I rely for effecting the moral regeneration of my country (and my attention was directed to the men whom I had before seen in the morning); these are masters of village schools, come here to imbibe my principles and to perfect themselves in their duty. These men have *six thousand* pupils under them; and if, by the blessing of God, I can continue the direction of them, success is certain."

To insure success M. de Fellenberg spares no pains,—no expense. There are no less than thirty-two professors solely devoted to his establishment, who inhabit a house to themselves upon the premises.

In all, there are about three hundred and fifty individuals in this little colony. Despite of his enemies, the spirit of De Fellenberg is spreading throughout Switzerland; and after having seen the parent institution, I visited several of his establishments in some of the remotest cantons.

A week closed my short sojourn at Hofwyl. I quitted it with a heavy heart; and the recollection of the moral beauty of what I there witnessed will remain riveted on my memory for ever.

Arable Husbandry.

REMARKS ON PUTTING IN SMALL GRAIN ON STUBBLE GROUNDS.

The worst system in cultivation in common practice seems to be stubbling in; or annually putting in crops of small grain on stubble grounds. This is too generally practised every where, but especially in the back-woods, until weeds and poverty of soil united, reduce the product so much that the crops fall far short of remunerating the cultivator for the labor bestowed on them. When this happens, he generally resorts to a naked fallow. This is too often badly executed. Still, many of the weeds that would have choaked and robbed the plants of much nutriment, are destroyed; consequently, the product is increased in proportion to the food remaining in the soil, and the cultivation bestowed on it.—*Loraine.*

A DEGREE OF MERIT IS JUSTLY DUE TO A NAKED FALLOW EXECUTED IN THE USUAL WAY.

A naked fallow is certainly a very laborious and injurious practice. It is also equally certain that any soil may be much better prepared for a succeeding crop of wheat, or any other small grain, by a fallow crop properly ordered. Still, a naked fallow should be allowed all the merit justly due to it; especially by those who mean to controvert that practice.

When it is well executed, the soil is finely divided. The animal and vegetable matter, which was before locked up in the hard clods of earth, impervious to the roots of the plants, is brought into more immediate use. The enriching and fertilizing matter floating in the atmosphere is more freely absorbed, and better secured, by an open, free soil, than when it rests on one of a contrary description. The roots of the plants are also enabled to dip deeper and spread wider through the soil, in search of the nutriment provided for them. It is true, if the ground be very sandy, a naked fallow, by opening the texture, makes it less fit for the roots of plants, and causes much injurious evaporation from it; likewise, when an adhesive clay has been finely pulverised, heavy rains, succeeded by a hot sun, or drying winds, causes it to bake, and become impervious to the roots of plants; but, except the advantage derived from the shade of the fallow plants, the same happens both in clay and sand, when the soil is prepared for small grain by a fallow crop cultivated in the usual way.

Jethro Tull, the ingenious inventor of the drill husbandry, grew exhausting crops annually on the same ground, without the aid of manure, although his soil seems to have been thin.

Sir H. Davy says, "Jethro Tull, in 1733, advanced the opinion, that minute earthy particles supplied the whole nourishment of the whole vegetable world: that air and water were chiefly useful in producing these particles from the land." If Sir H. had quoted the words of this truly great, but very mistaken agriculturist, the question would have been determined. Some years have elapsed since I read Mr. Tull's book on agriculture. If my memory be correct, he attaches more consequence to the depositions from the atmosphere than Sir H. seems to imagine; and appeared to believe they were conveyed to the soil by the dews. However, Mr. Tull's practice alone is sufficient to determine, that vegetation is greatly promoted by finely dividing the soil; particularly when the cultivation is extended to the growing crops. The practice of ages clearly shows, that much more is to be expected from a naked fallow than too many advocates for fallow crops seem to believe. Still, if Mr. Tull had lived until he had divided the soil sufficiently often to have extracted the animal and vegetable matter that the undivided clods contained; also, to have decomposed the hard vegetable substances which are always more or less seen, in greater or smaller quantities, in all soils; his opinion respecting enriching manures would have been greatly altered; as was that of Mr. Duhamel, a distinguished agriculturist of the same school, but who lived long enough to see the fallacy of this inconsiderable theory, and also to abandon it.—*Ib.*

THE DISADVANTAGES ARISING FROM THAT PRACTICE CONSIDERED.

Having candidly stated every advantage that seems to be derived from a naked fallow, I will enumerate the very serious disadvantages and injurious consequences arising therefrom.

It is an expensive practice. First, the loss of one full year's rent of the soil. Secondly, it must be frequently ploughed, harrowed and rolled. After this, it often happens that much manual labor is necessary to break the clods, especially when they are firmly bound together with the roots of the grasses and weeds. These are push-

ed about by the plough, dragged by the harrow, and sunk into the soil by the roller, but not sufficiently separated by any of them. The remains of them, together with the more finely divided grasses and weeds, are dragged up into heaps by the harrow throughout the whole field. These are raked up into larger heaps and burned by some cultivators. Others suffer them to remain, and when the seed is sown, the harrow, by dragging the heaps, drags up much of the seed with them; and vegetation is destroyed wherever they may happen to lie. In either case, a great waste of vegetable matter takes place; for when it is not burned, its best properties are exhaled by the sun, or scattered in the air. Numbers of men, women and children are sometimes seen in England, breaking the hard matted clods into pieces, raking them up into heaps, and burning this very valuable vegetation, which, without any of this enormous waste of labor, might have been very profitably applied to the growth of the crops, and improvement of the soil. After the utmost care has been taken to prepare a naked fallow in the usual way, a multitude of the roots and tops of the grasses and weeds remain so intimately mixed within the soil, that they will grow in sufficient numbers to do great injury to the crop; especially if the weather happens to be dripping during the process of cultivation. In that case, the moisture preserves the vegetative powers of the grasses and weeds, and the crop is sure to be much injured by them.

The seeds of the weeds are as often turned under as uppermost, by the usual mode of cultivation; consequently, many of them do not vegetate during the process; and those that are not buried beyond the power of germination, when the small grain is sown, will grow and injure the crop. If dung is applied for the small grain, it is generally spread previously to seeding, and turned under by a shallow furrow; of consequence, it produces a plentiful crop of weeds, for although the cookers of dung say that the fermentation of it destroys the vegetative property of seed, practice and observation determine the contrary.

In fact, if nature had not calculated seeds in general to withstand much more than the heat of a fermenting dunghill, the earth would long since have been stripped of vegetation, particularly where ploughers and croppers reside. Like the locust in Egypt, they would soon destroy every green thing, if nature had not reserved seeds for ages unhurt, with which she carefully counteracts so much of the injury done by this class of farmers, as to prevent actual sterility from taking place in the grounds cultivated by them.—*Ib.*

THE USUAL MODE OF CUDTIVATING FALLOW CROPS CONTRASTED WITH THE PRACTICE RECOMMENDED BY THE AUTHOR.

Although it is granted, that a naked fallow prepares much food for plants, by finely dividing the soil, frequent ploughing and harrowing and harrowing are calculated to scatter much animal and vegetable matter in the air; especially while the soil is continually exposed to the injurious effects of the sun and air; and unless the bad effects produced by this process be counteracted by excellent management in other respects, it will eventually ruin the soil. If this practice be pursued, under the best mode of management, that superior talents can devise, the improvement in the soil will be slow indeed, when compared with that which may be readily effected, by the practice of fallow crops properly ordered. It is also evident, that in the latter case the grounds are profitably employed, while in the former they yield nothing; although the farmer is spending much money in the very laborious cultivation of them.

No improvement made in agriculture has promoted the interest of it so extensively as the introduction of fallow crops. Yet it seems evident, that the various different modes which have been generally pursued in the cultivation of these crops, as well as in that of the cultivated crops following them, are by no means calculated to promote the product of either, or to enrich the soil, to any thing like that extent, which might be readily effected with much less labor and expense, if a proper system of cultivation were pursued. If, however, distinct parts of the very numerous and discordant systems of cultivation be selected from the different practices, that are commonly pursued by different cultivators, it appears that nothing is offered by me, which has not been more or less sanctioned by the actual practice of others. Therefore, the merit on my system of husbandry does not consist in overturning what the practice and observation of ages have introduced: but in uniting into one system such practices as are consistent with nature, reason and common sense, rejecting those only that seem to be inconsistent with either. The undertaking is arduous, especially when ventured upon by a plain practical farmer, who depends not on science, but on nature, reason, practice and observation. In a work of this sort, errors are to be expected; still, as these errors cannot be capital, but little injury is to be expected from them, before they may be corrected by those who are better informed.—*Ib.*

OBSERVATIONS ON THE VALUE OF GRASS LAYS, AND THE PROPER CULTIVATION OF THEM.

Agriculture will never reach its zenith, until the value of grass lays is sufficiently appreciated, and the cultivation of them much better understood. The value of a clover lay, when applied for wheat, is well known. Still, most farmers continue frequent mowing, or close pasturing, until the clover is nearly run out. This greatly impoverishes the lay, and unless the soil be rich, the wheat crop is light. The clover plant cannot withstand frequent cutting, even during the first season it is mown. This causes the lateral roots of the plants to become weak, and incapable of holding the tap-roots in the ground; and they are thrown out by the frosts of the ensuing winter and spring. The same happens if red clover be pastured, unless a well grown covering of the tops of the grass be preserved; especially to defend the roots and crown of the plant, from the frosts of the ensuing winter and spring. If this plant be thus defended, it will far better withstand, not only the frosts in winter and spring, but also the injurious heat of the sun.—*Ib.*

THE RED CLOVER PLANT IS DESTROYED BY FREQUENT MOWING AND CLOSE PASTURING.

Both red clover and speargrass lays are very justly esteemed by many farmers, as the best preparation for a fallow crop of maize.—Some, either to save labor or from a just conviction that the value of the crop is also greatly increased, do not turn the sod in the cultivation of the fallow plants. Too many of them, however, as well as other cultivators, believe the health and vigor of the plants are greatly promoted by harrowing over them while they are young. Some, also, use harrows with sharp cutting tines, for the purpose of cutting through the sod deeply, and as near to the stems of the plants as may be conveniently done, without cutting or tearing up. These practices are certainly opposed to the economy of nature, and the enlightened reason of man. None of these gentlemen would wound, bruise or mangle a young animal, to increase the health and vigor of it; neither would they rend and tear the choice trees in their nurseries to make them grow better; although less evil would arise from mangling them, as trees are calculated much better to withstand and outgrow this very manifest injury. The practice of mutilating the tops, and separating the roots of plants from their stems, for the express purpose of causing them to grow much more luxuriantly, is not confined to maize; potatoes and other hardy plants, that are capable of withstanding this truly barbarian practice, are too often subjected to it.—*Ib.*

FERMENTATION, PROPERLY DIRECTED, IS THE MAIN SPRING OF VEGETATION.

Although some farmers do not turn up the sod in the cultivation of maize, all of them, so far as my observation extends, plough it up previously to seeding the small grain that follows this plant. This exposes the rich matter arising from the fermentation of the roots and tops of the grasses, and the dung also, if that has been applied, to a serious waste. It is exhaled by the sun, scattered in the winds, and washed away by the rains and melting snows. Fermentation, which is the main spring of vegetation, is checked. None of these evils happen when the small grain is put in by a superficial cultivation; as the rich fertilizing matter remains securely buried within the soil. This, nature applies, with the least possible loss, to the use of the cultivated crops, and the grasses following, and with the overplus she enriches the soil. The fermentation and decay of this enriching matter, more effectually expands, and minutely divides, the soil, than can be done with the plough. The plough, harrow and roller, with, too often, the addition of very expensive manual labor, are capable of pulverizing the soil to any desirable extent. After this has been done, it settles, and too often becomes impervious to the roots of the plants, unless the ground be so rich, that it is not materially affected by the loss of the animal and vegetable matter which always takes place, when the soil is cultivated in the usual way.

It should, also, be recollected, that every crop which is sown broad cast, principally depends on the expanding force of fermentation, to keep the soil open and mellow, for the ready admission of the roots of the plants; likewise, that when the grain is filling the plants re-

quire the most nutriment; and that previously to this the soil is considerably consolidated by time, unless it has been kept open and mellow by the fermentation of the animal and vegetable matter contained in it, or consists principally of sand. In the latter case, the lack of animal and vegetable matter causes much injurious evaporation of moisture. This, if the season does not happen to be dripping, greatly reduces the product of the grounds.—*Ib.*

[*From the Northern Farmer.*]

MANURES.

Manures to a farm are what blood is to the human body. The first object of a farmer should be to obtain, and preserve in the best manner, all the animal, vegetable and compost manures, which can be made upon his farm, or procured elsewhere; but unless properly preserved, much of his labor is wasted, and his lands are less productive. Fair experiments have clearly proved that the manure of cattle, preserved under cover or in vaults under barns, possesses a third more value at least, than the same kind which has remained exposed to rains and the action of the atmosphere. This will not be doubted by any one who has any correct information upon the subject, or has by experiment ascertained the difference. We cannot well explain the reason of this great difference, without adopting the style and terms of the chemist; but as our object is not to enlighten the learned, we therefore reject technical terms, and use language more familiar.

Vegetation is caused not so much by the quantity of manure mixed in the soil, as by its nutritious qualities. Should all farmers understand the fact, that none of the earthy or solid part of manure enters into plants, or in other words, that it is *only the liquid parts, or that portion of manure which combines or unites with water, which produces vegetation*, or causes the corn to grow, they would then perceive the necessity of preserving animal manure in vaults, under cover. The only value which the earthy part of the manure has, is to keep the soil into which it is ploughed, in a loose, pulverized state, so as to render it capable of retaining, after rains, a greater quantity of moisture.

Some farmers have expressed an opinion, that the urine of cattle promotes vegetation as much as their manure. But whatever may be the differences in value, it is surely very important that the urine should be preserved in vaults mixed with the manure.

In the spring, when the manure is conveyed into the field, it should be ploughed in immediately, and spread no faster than becomes necessary for ploughing; because at this season the warmth of the sun produces a rapid fermentation, the most valuable or liquid part of the manure escapes in the form of gas, as it is often expressed, by evaporation.

Should a heap of manure at this season be covered with earth two feet deep, in a short period the whole mass of earth would be enriched by the gas, arising from the fermented manure. Hence the utility of covering fresh barn yard manure with earth, straw, litter, weeds, street and door yard scrapings, mud from swamps, and all kinds of decomposed vegetable matter. Skilful farmers will always make as large a quantity of compost manure as possible.—It is a very certain way to enrich a farm, and ensure abundant crops. If these truths are conceded, then it conclusively follows that the general practice of our farmers in respect to manure is injudicious. They let the manure lie in large yards, or the open field, exposed to heavy rains and the action of the atmosphere. A large portion of the nutritive qualities escapes in gas, or is washed away by the heavy rains. The greater the exposure to the atmosphere, the greater the loss. Therefore the practice of carting out the barn-yard manure in the fall, and spreading it in small heaps upon the soil intended for ploughing in the spring, is still more censurable. But the fall manure is often carted into the fields and deposited in one or two large heaps to rot, for the purpose of manuring the corn and potato hills in the spring; and strange as it may seem, many old farmers yet believe that old rotted manure promotes vegetation better than fresh, or unfermented manure! They appear to be ignorant of the fact, that the longer manure remains exposed to rot, the less nutriment, or food for the plants it retains; and the more it becomes assimilated to mere earth.

To put either fresh or rotted manure in the hill, in the season of planting potatoes and corn, as a general practice, is injudicious.—But half the quantity of fresh, unfermented manure, in the hill, well mixed in the soil, would afford probably more nutriment than double the quantity of old rotted manure.

The moisture, necessary to vegetation, is conveyed to the roots of young trees, or the corn, or other plants, through the medium of earth. If any light or dry material is in contact with the roots, it tends to cut off the regular and natural supply of water, and the plant must either extend its roots through the dry substance to draw its supply of moisture or else become feeble, and perhaps perish.—Hence, in a dry season, more particularly, manuring in the hill, often proves very injurious to the growth of plants. If manuring the corn hill is ever judicious, it is only on a cold, moist and sterile soil, or swarded land deeply ploughed, where a farmer has not a sufficient quantity of manure to mix in the soil. The surest method to enrich the soil for future years, is to plough in the manure. The roots of corn, extending several feet around the hill, will find whatever nourishment the soil contains; and it is far better to afford a sufficient supply when the corn is coming to maturity, than merely to force the kernel to vegetate a few days earlier by means of a hotbed.

Our preceding remarks show the importance of covering manure well with earth, previous to its fermentation. Hence the common practice of spreading the manure upon the surface, and "harrowing it in," is attended with great loss, as a large portion will remain dry upon the surface, and for no other use than to enrich the atmosphere.

Manure being the life of a farm, every exertion should be used to procure all kinds of it. Compost, soot, ashes, lime, gypsum, burnt clay or soft bricks pulverized, decomposed vegetable substances, weeds, leaves of trees, coarse grass, &c. &c. will all tend to fertilize the soil. None are ignorant that such as is taken from the vaults, afford the greatest quantity of nutriment to plants. On farms it ought never to be lost. The yards for swine, ought always to be excavated, or be in the form of a basin, so that this manure, in richness next to the last, should be preserved in a moist state.—The same remark applies to the barn-yard for other cattle, except that the latter ought to have a level and dry margin for feeding cattle occasionally. Soon after planting in the spring, a farmer ought to commence hauling into these yards the different substances we have enumerated, and any others within his reach, which can be converted into manure. These substances will become incorporated with the manure of the cattle, and also absorb their urine, and the whole mass will be less liable to dry up and waste in the summer season.

A good farmer will be careful to yard his cattle at night as much as practicable through the warm, and in the day time, in the winter seasons. It has been found to be very beneficial to keep the cattle yards in a moist state by means of aqueducts, whenever practicable. In fine, farmers should spare no labor or expense to obtain a plentiful supply of manure to fertilize the soil. The liberality to "Mother earth" will be repaid with equal abundance.

In England nothing is lost, which can be converted into manure. And some English farmers fertilize their fields, in part, with the pulverized bones of animals; and for this purpose, have even gathered human bones from the plains of Waterloo.

W. CLAGGETT.

Portsmouth, January 16, 1834.

[*From the Genesee Farmer.*]

NAKED FALLOWS NOT NECESSARY.

I am well aware that it is a hopeless task to undertake to persuade many of my brother farmers, that naked fallows are in no case necessary, and generally prejudicial; but such being my belief, and I may add my experience, I shall endeavor to point out the benefits of fallow crops, and I trust there are some among the readers of the Genesee Farmer, who will be open to conviction.

The principal reasons offered by farmers in favor of naked fallows, are, that weeds are thus more effectually destroyed; that the soil is sweetened by exposure to the sun and air; and that it is more thoroughly pulverized.

I shall undertake to show that they are mistaken in every point, and in so doing I shall state my own experience.

In the autumn and winter of 1829, I had 13½ acres ploughed to the depth of seven or eight inches. The work, owing to frost, was not completed till Christmas. In ploughing this depth, two or three inches of solid clay was turned up, which had never before been disturbed. My neighbors predicted that it would not produce a good crop of corn. In the spring of 1830, I found that the harrow com-

pletely fitted the ground for sowing and planting. I sowed 3½ acres with oats, 4 with peas, planted 5 acres with corn, and 1 with potatoes. My crops were the best in the neighborhood, especially the peas and corn. I the fall I prepared the whole for wheat, the oat ground by two ploughigs, (harrowing in place of the first would have been better,) the residue by one; found the pea and corn ground finely pulverized and clean, and sowed it, some as late as the 10th October.

In the course of the summer I had prepared a naked fallow of 16 acres adjoining the above, which was in the best possible state, being ploughed to the depth of eight inches, and sowed it before the other. In the autumn and spring the wheat on the 16 acres had the most promising appearance; but as the season advanced, that on the pea ground had the superiority. At harvest the result was as follows: The wheat on the pea ground was too stout, as much of it was down and had to be reaped. That on the corn ground filled the best of any, and was very handsome; I think it yielded more than 25 bushels per acre. The naked fallow was the next best, and the oat and potato ground produced the poorest crop, but this was owing principally to a considerable part of the ground being too wet.

If farmers on stiff soil would draw all their manure to their corn and potato grounds in the fall, and *then plough deep* for their spring crops, and sow wheat after crops of peas, barley and corn, I most fully believe that their fields would be as clean, and their crops as good, as if sowed on naked fallows; if so, their spring crops would be clear gain. ONTARIO.

Cattle Husbandry.

THE MIDDLE HORNS.

Of these there are many varieties or mixtures, of which the Devon, the Hereford and the Sussex cattle are most noted. Of these the Devon only are found in any numbers among us. We shall therefore proceed to quote, from the Farmers Series of the Library of Useful Knowledge, a description of Devon cattle.

THE DEVON BULL.—(*A middle horn.*)

"The horn of the *bull* ought to be neither too low nor too high, tapering at the points, not too thick at the root, and of a yellow waxy color. The eye should be clear, bright and prominent, showing much of the white, and it ought to have around it a circle of variable color, but usually a dark orange. The forehead should be flat, indented and small; for by the smallness of the forehead the purity of the blood is estimated. The cheek should be small, and the muzzle fine: the nose should be of a clear yellow. A black muzzle is disliked, and even a mottled one is objected to by some who pretend to be judges of the true Devon. The nostril should be high and open; the hair curled about the head, and giving, at first appearance, an idea of coarseness, which soon wears off. The neck should be thick, and that sometimes almost to a fault.

"Excepting in the head and neck, the form of the bull does not differ materially from that of the *ox*. The head of the ox is small, very singularly so, relative to the bulk of the animal, yet it has a striking breadth of forehead. It is clean and free from flesh about the jaws. The eye is very prominent, and the animal has a pleasing vivacity of countenance, plainly distinguishing it from the heavy aspect of many other breeds. Its neck is long and thin, admirably adapting it for the collar, and even for the more common and ruder yoke.

"The want of the beautifully arched form of the neck, which is seen in the horse, has been considered as a defect in most breeds of cattle. It is acounted one of the characteristics of good cattle that the line of the neck, from the horns to the withers should scarcely deviate from that of the back. In the Devonshire ox, however, there is a peculiar rising of the forehead, reminding us not a little of the blood horse, and essentially connected with the quick and free action by which this breed has ever been distinguished. It has little or no dewlap depending from its throat. The horns are longer than those of the bull, smaller and fine even to the base, and of a lighter color, and sometimes tipped with yellow. The animal is light in the withers; the shoulders a little oblique; the breast deep, and the bosom open and wide, particularly as contrasted with the fineness of the withers. The fore legs are wide apart, looking like pillars that have to support a great weight. The point of the shoulder is rarely or never seen. There is no projection of bone as in the horse, but there is a kind of level line running on to the back.

"These are characteristic and important points. Angular and bony projections are never found on a beast that carries much flesh and fat. The fineness of the withers, the slanting direction of the shoulder, and the broad and open breast, imply both strength and speed, and aptitude to fatten. A narrow chested animal can never be useful for working or grazing.

"With all the likeness of the Devonshire ox, there is a point about him, disliked in the blood or riding horse, and not always approved in the horse of light draft,—the legs are far under the chest, or rather the breast projects far and wide before the legs. We see the advantage of this in the beast of slow draft, who rarely breaks into a trot, except when he is goaded on in *catching times*, and the division of whose foot secures him from stumbling. The lightness of the other parts of his form, however, counterbalances the appearance of heaviness here.

"The legs are straight, at least in the best breeds. If they are in-kneed, or crooked in the fore legs, it argues a deficiency in blood, and incapacity to work; and not only for work, but for grazing too, for they will be hollow behind the withers, a point for which nothing can compensate, because it takes away so much from the place where good flesh and fat should be thickly laid on, and diminishes the capacity of the chest, and the power of creating arterial and nutritious blood.

"The fore arm is particularly large and powerful. It swells out suddenly above the knee, but is soon lost in the substance of the shoulder. Below the knee the bone is small to a very extraordinary degree, indicating a seeming want of strength; but this impression immediately ceases, for the smallness is only in front—it is only in the bone. It is the leg of the blood horse, promising both strength and speed. It may perhaps be objected that the leg is a little too long. It would be so in an animal that is destined only to graze; but this is a working animal, and some length of leg is necessary to get him pleasantly and actively over the ground.

"There is a trifling fall behind the withers, but no *hollowness*, and the line of the back is straight from them to the setting on of the tail. If there is any seeming fault in the beast, it is that the sides are a little too flat. It will appear, however, that this does not interfere with feeding, while a deep, although somewhat flat chest, is best adapted for speed.

"Not only is the breast broad, and the chest deep, but the two last ribs are particularly bold and prominent, leaving room for the stomach and other parts concerned in digestion to be fully developed. The hips, or huckles, are high, and on a level with the back, whether the beast is fat or lean. The hind quarters, or the space from the huckle to the point of the rump, are particularly long, and well filled up—a point likewise of very considerable importance both for grazing and working. It leaves room for flesh in the most valuable part, and, like the extensive and swelling quarters of the blood horse, indicate much power from behind, connected with strength and speed. This is an improvement quite of modern date. The fullness here, and the swelling out of the thigh below, are of much more consequence than the prominence of fat which is so much admired on the rump of many prize cattle.

"The setting on of the tail is high; it is on a level with the back, rarely much elevated, and never depressed. This is another great point in the blood horse, as connected with the perfection of the hind quarters. The tail itself is long and small, and taper, with a round bunch of hair at the bottom.

"The skin of the Devon, notwithstanding his curly hair, is exceedingly mellow and elastic. Graziers know that there is not a more important point than this. When the skin can be easily raised from the hips, it shows that there is room to set on fat below.—The skin is thin rather than thick. Its appearance of thickness arises from the curly hair with which it is covered, and is curly in proportion to the condition and health of the animal. Good judges of these cattle speak of these curls as running like little ripples of wind on a pond of water. Some of these cattle have their hair smooth, but then it should be fine and glossy. Those with curled hair are somewhat more hardy, and fatten more kindly. The favorite color is a blood red. This is supposed to indicate purity of breed; but there are many good cattle approaching almost to a chesnut hue, or even a bay brown. If the eye is clear and good, and the skin mellow, the paler colors will bear hard work, and fatten as well as others; but a beast with a pale skin, and hard under

the hand, and the eye dark and dead, will be a sluggish worker, and an unprofitable feeder. These, however, that are of a yellow color, are said to be subject to *sleat* (diarrhœa.)

Science of Agriculture.

OF THE USES OF THE SOILS TO VEGETABLES.

Soils affords to plants a fixed abode and medium of nourishment.—Earths, exclusive of organized matter (animal and vegetable substances,) and water, are allowed by most physiologists to be of no other use to plants, than that of supporting them, or furnishing a medium by which they may fix themselves to the globe. But earths and organic matters, that is, soils, afford at once support and food.

The pure earths merely act as mechanical and indirect chemical agents in the soil.—The earths consists of metals united to oxygen, (a constituent of the atmosphere) and these metals have not been decomposed; there is consequently no reason to suppose that the earths are convertible into the elements of organized compounds, that is, into carbon, hydrogen and azote, (three substances which make up the bulk of all plants.) Plants have been made to grow in given quantities of earth. The consume very small portions only; and what is lost may be accounted for by the quantities found in the ashes: that is to say, it has not been converted into any new product. The carbonic acid united to lime or magnesia, if any stronger acid happens to be found in the soil during the fermentation of vegetable matter, which will disengage it from the earths may be decomposed; but the earths themselves cannot be supposed convertible into other substances, by any process taking place in the soil. In all cases the ashes of plants contain some of the earths of the soil in which they grew, but these earths, as has been ascertained by the earths afforded by different plants, never equal more than one-fiftieth of the weight of the plant consumed. If they be considered as necessary to the vegetable, it is as giving hardness and firmness to its organization. Thus it has been mentioned that wheat, oats, and many of the hollow stalked grasses, have an epidermis [outer bark] principally of silicious earth; the use of which seems to be to strengthen them, and defend them from the attacks of insects and parasytical [which grow and feed upon others] plants.

The true nourishment of plants is water, and decomposing organic matter, [rotted vegetable and animal substances]; both these exist in soils, not in pure earths: but the earthy parts of the soil are useful in retaining water, so as to supply it in the proper proportions to the roots of the vegetables, and they are likewise efficacious in producing the proper distribution of the animal or vegetable matter. When equally mixed with it they prevent it decomposing too rapidly, and by their means the soluble parts are supplied in proper proportions.

The soil is necessary to the existence of plants, both as affording them nourishment, and enabling them to fix themselves in such a manner as to obey those laws by which their radicles are kept below the surface, and their leaves exposed to the free atmosphere. As the system of roots, branches, and leaves, are very different in different vegetables, so they flourish most in different soils; the plants that have bulbous roots require a looser and lighter soil than such as have fibrous roots; and the plants possessing only short fibrous radicles demand a firmer soil than such as have tap-roots or extensive lateral roots.

The constituent parts of the soil which give tenacity and coherence are the finely divided matters; and they possess the power of giving those qualities in the highest degree when they contain much alumina. A small quantity of finely divided matter is sufficient to fit a soil for the production of turnips and barley; and a tolerable crop of turnips has been produced on a soil containing eleven parts out of twelve sand. A much greater proportion of sand, however, always produces absolute sterility. Vegetable or animal matters, when finely divided, not only give coherence, but likewise softness and penetrability; but neither they nor any other part of the soil must be in too great proportion; and a soil is unproductive if it consist entirely of impalpable matters. Pure alumina or silica, pure carbonate of lime, or carbonate of magnesia, are incapable of supporting healthy vegetation; and no soil is fertile that contains as much as nineteen parts out of twenty of any of these constituents.

A certain degree of friability or looseness of texture is also required in soils, in order that the operations of culture may be easily conducted; that moisture may have free acbess to the fibres of the roots, that heat may be readily conveyed to them, and that evaporation may proceed without obstruction. These are commonly attained by the presence of sand. As alumina possesses all the properties of adhesiveness in an eminent degree, and silex those of friability, it is obvious that a mixture of these two earths, in suitable proportions, would furnish every thing wanted to form the most perfect soil as to water and the operations of culture. In a soil so compounded, water will be presented to the roots by capillary attraction. It will be suspended in it, in the same manner as it is suspended in a sponge, not in a state of aggregation, but minute division, so that every part may be said to be moist, but not wet.—[*Grisenthwaite.*

The power of the soil to absorb water by cohesive attraction depends in great measure upon the state of division of its parts; the more divided they are, the greater is their absorbent power. The different constituent parts of soils likewise appear to act, even by cohesive attraction, with different degrees of energy. Thus vegetable substances seem to be more absorbent than animal substances; animal substances more so than compounds of alumina and silica; and compounds of alumina and silica more absorbent than carbonates of lime and magnesia; these differences may, however, possibly depend upon the differences in their state of division, and upon the surface exposed.

The power of soil to absorb water from air is much connected with fertility. When this power is great, the plant is supplied with moisture in dry seasons; and the effect of evaporation in the day is counteracted by the absorption of the aqueous vapor from the atmosphere, by the interior parts of the soil during the day, and by both the exterior and interior during the night. The stiff clays approaching to pipe clays in their nature, which take up the greatest quantity of water when it is poured upon them in a fluid form, are not the soils which absorb most moisture from the atmosphere in dry weather. They cake and present only a small surface to the air; and the vegetation on them is generally burnt up almost as readily as on the sands. The soils which are most efficient in supplying the plant with water by atmospheric absorption, are those in which there is a due mixture of sand, finely divided clay, and carbonate of lime, with some animal or vegetable matter, and which are so loose and light as to be freely permeable to the atmosphere. With respect to this quality, carbonate of lime, and animal and vegetable matter are of great use in soils; they give absorbent power to the soil without likewise giving it tenacity; sand, which also destroys tenacity, on the contrary, gives little absorbent power. The absorbent power of soils, with respect to atmospheric moisture, is always greatest in most fertile soils; so that it affords one method of judging of the productiveness of land.

As examples of the absorbent powers of soils: One thousand parts of a celebrated soil from Ormiston, in East Lothian, which contained more than half is weight of finely divided matter, of which eleven parts were carbonate of lime, and nine parts vegetable matter, when dried at two hundred and twelve degrees, gained in an hour by exposure to the air saturated with moisture, at a temperature of sixty-two degrees, eighteen grains. One thousand parts of a very fertile soil from the banks of the river Parret, in Somersetshire, under the same circumstances, gained sixteen grains. One thousand parts of a soil from Mersea, in Essex, gained thirteen grains. One thousand grains of a fine sand, from Essex, gained eleven grains. One thousand of a coarse sand gained only eight grains. One thousand of a soil of Bagshot Heath, gained only three grains.

Household Affairs.

Mr. Cultivator—As household economy comes within the purview of your duties, I hope you will permit me to trouble you with an occasional communication upon this subject; for farmers wives, as well as farmers, are capable of deriving benefit and instruction from each other's experience. I shall begin with

My method of Cooking a Calve's-head.—First of all get the head, pluck and trotters of a *good* calf, and have them nicely cleaned, so that there is not a hair to be seen upon them. Cut open the head and take out the brains. Then boil the head, feet and haslet, till all the bones will freely separate from the flesh, in a goodly quantity of water, and without salt. After which, take out the bones, and divide the meat, &c. into three parts, in the proportions that may be desired. Take one portion, cover and set it by the fire, where it will keep warm, to be served up plain, and to be eaten with drawn butter and vegetables. Chop fine some fat salt pork and veal from the leg, in the proportion of four of veal to one of pork, season with

sage and pepper, and fry well in butter. Take also a pound of fat pork, cut into shreds, and fry brown; then in the fat which the pork produces, fry thoroughly a quart of sliced onions. A second portion of the head, &c. is then to be fried in butter, which is to serve, with a part of the forced meat balls, as a second dish. The third portion of the meat is then to be chopped fine, and put into the liquor in which the head has been boiled, together with the brains and fried pork and onions, the whole seasoned with pepper, cloves, thyme and marjoram, or such of these as are at command, and boiled briskly at least an hour and a half. The soup may be served up with a part of the meat balls, and the yolks of half a dozen eggs boiled hard, and epicures may add lemons or claret if they have them. The fried dish may be garnished with parsley and eggs. In this way, from materials which may be produced on every farm, with the exception of a fippenny-worth of spices, may be made four or five gallons of as rich and grateful a soup as ever graced an alderman's board, and boiled and fried enough to dine Maj. Jack Downing's brigade of militia.

I like *our* yankee *Johnny-cakes* well; but as I like them of the south better, I have obtained, and successfully practised, the following Virginia method of making the latter. Take one quart of milk warm from the cow, two eggs, a tea-spoonful of salaratis, and Indian meal sufficient to make a batter of the consistence of pancakes. Bake quick, in pans previously buttered, and eat warm.

I will trouble you with only one other receipt, at this time, for a farmer's dish, and that is for what is called

A Bird's-nest Pudding.—Pare and core six or eight good tart apples, so as to leave them whole, and place them in a pudding dish. Take a quart of milk, nine eggs and sufficient wheat flour to make a thin batter; pour on to and cover the apples; bake in an oven till done; and eat with a sauce of sugar and butter, either cold or melted.

A FARMER'S WIFE.

Miscellaneous.

EXPERIMENTS WITH GYPSUM.

BY THE LATE JOHN TAYLOR, OF VIRGINIA.

A few of the experiments I have made with gypsum, are mentioned, to take a chance for adding a fact to your information on that subject.

1803, March 15th. Oats and clover, both just up, plastered them at one bushel to the acre; three weeks after, plastered them again with the same quantity. Upon both occasions left the richest portion of the plat unplastered. This only produced one-third, both of oats and clover, of the plastered lands.

April. Mixed or rolled a bushel of plaster with as much seed corn, keeping it wet whilst planting. With such rolled seed planted a field of 40 acres, except eight rows through the centre which were unplastered. The land poor. The inferiority of these eight rows was visible, from the moment the corn was up, to its being gathered.

1804. April. Rolled the seed corn of two hundred acres in like manner, leaving eight rows across the field, so as to intersect with flat, hilly, sandy, stiff, rich and poor land. Their inferiority was so visible, that from an eminence in the field, a stranger could point out the eight rows from the time the corn was three inches high, until it was all in tassel. In this, the eight rows were a week later than the plastered corn. The plastered corn stood the best, was forwardest, and produced the greatest crop. Its fodder dried about ten days sooner.

1805. April. Plastered as above, the seed corn of 30 acres of rich *moist* land, leaving eight rows. Corn injured by too much rain. No difference between the eight rows and the rest.

May 7th. Replanted my corn on high land, which had been much destroyed by mice, moles and birds, mixing two quarts of tar well with one bushel of seed corn, and then plastering it as above. The best remedy I ever tried against those evils, and the plaster as usual accelerated and benefitted the corn.

April 25th. Plastered three bushels on three acres of clover just up, sown alone on land half manured with coarse manure. A good crop.

May 9th. Seven bushels on seven acres of forward wheat and clover. Wheat heading; land thin; the clover exceeded what such land had usually produced. No benefit to the wheat.

May 10th. Six bushels on six acres of very bad clover sown last spring. Clover just beginning to bloom. The season became moist and it improved into a fine crop.

May 10th. Last spring I left an unplastered strip of 20 feet wide quite across a field of clover. It was all cut except this strip, which was so bad as not to be worth cutting. This spring on this day, (clover beginning to bloom,) the strip was still much inferior to the adjoining clover, which was good. I plastered it at a bushel to an acre, leaving the rest of the field unplastered. It equalled the adjoining clover in one month.

May 16th. Sowed 23 bushels on 23 acres of corn in a large field. Ploughed in part immediately, harrowed in part, and left part on the surface ten days before it was worked in. Corn four inches high. Weather moist. No difference between the three divisions. The seed of the whole field had been rolled. These 23 acres exceeded the adjoining corn 25 per cent: its blades and tops also dried sooner.

June 15th. Plastered at three bushels to the acre, a strip of goose grass or English grass—no effect on land or grass.

August 10th. Sowed 50 acres of thin sandy land, in corn at the time, in clover, and 40 bushels of plaster on the seed, harrowing both lightly in. A moderate shower in four days, succeeded by a severe drought. Clover sprouted and chiefly perished. A good cover of bird-foot clover followed; land so visibly improved, that a stranger could mark the line of the plastering by the growth. That and the adjoining land in corn in 1808. The difference visible in favor of the plastered land.

September 17th, to the 5th of October. Sowed 88 bushels of yellow latter bearded wheat; 171 of forward, mixing half a bushel of plaster with one of wheat, a little wetted. One bushel of forward, and three pecks of latter wheat were sown to an acre. All among corn. Two slips of 30 feet each were left across the field, in which unplastered wheat was sown. Where the land was sandy, the unplastered wheat was best, owing to the great growth of bird-foot clover among the plastered. This discovered the effect of gypsum on that annual grass. Where this grass did not appear there was no difference between the plastered and unplastered wheat. From the spring of 1806 to this time, the unplastered slips have been distinctly marked, by a vast inferiority of the weeds and grass naturally produced.

November 23d. Sowed three bushels of plaster on one and a half acres of wheat, left unplastered for the purpose, in the field last mentioned, on the surface. Weather moist. No effect on the wheat, on the ground, or in the growth, to this day, though the plaster was of the same kind with that used in the last experiment.

1806, March and April. Sowed 200 acres of clover with plaster, at different times when the weather was dry, moist, windy, and still, part at three pecks—a bushel and five pecks to the acre, leaving a slip of 20 feet wide across the field, to ascertain the goodness of the plaster, which was of a hard white kind, that hitherto used being soft and streaked. The clover in this strip was bad, on each side of it fine. No apparent difference was produced by weather, quantity or times of sowing. The whole crop far surpassed in goodness whatever such lands had produced before, except the slip, as to which Pharaoh's dream seemed reversed.

April and May. Rolled all my seed corn as usual, leaving slips unplastered. An excessive drought. No difference between these slips and the rest of the field. The following year when that grass grew, tufts of luxuriant bird-foot clover designated the exact spots where the plastered corn had been planted.

April 23d. Sowed 16 bushels of plaster on eight acres of oats and clover, just up, intending to have a great crop, and leaving a slip. Land naturally fine and highly manured. Drought as above excessive. Oats bad. No difference between the slip and the rest. Clover killed. Land ploughed up in September and put in wheat. Clover sown in 1807 on the wheat. A heavy crop of wheat, clover plastered in March 1808, at a bushel to the acre; crop very great. No inferiority in the slip unplastered in 1806.

1807, March 1st to 12th. Sowed clover seed on one hundred acres in wheat, and 80 bushels of plaster, the sowers of the latter following those of the former. Left a strip of 20 feet. Weather dry, moist, windy or calm, and for two days of the sowing a snow two inches or less deep on the ground. Land stiff, rich, poor or sandy, and of several intermediate qualities. The clover came up better than any I ever sowed on the surface; the strip was a little, and but a little, inferior to the adjoining clover, which I attribute to its receiving some plaster from the effect of a high wind.

The whole field received three pecks to the acre in 1808, and was the best piece of high land grass of the size I ever saw. The wheat received no benefit.

March 10th. Sowed 40 bushels of plaster on 60 acres of poor land, cultivated in corn (Indian) last year, and well set with bird-foot clover, leaving an unplastered slip. Weather dry and windy. Effect vast. Strip visible to an inch, as far off as you could distinguish grass. The bird-foot clover died, and a crop of crab grass shot up through it, and furnished a second cover to the land.

1807 and 1808. In these two years all my corn ground as it was broken up or listed, has been plastered broad cast, with from three pecks to a bushel to the acre, and directly ploughed in, and both the seed corn and seed wheat have been rolled bushel to bushel. In both, the crops have greatly exceeded what the fields have ever before produced. That cultivated last year has doubled any former product. But they have been aided in spots with manure, and the years were uncommonly fruitful. All the manure carried out in these two years, has been sprinkled with plaster when spread before being ploughed in, and several fields of the bird-foot clover have been plastered. The results conform to those already mentioned.

1808, February. Plastered four ridges of highland meadow oat at a bushel to the acre. No effect.

Some of the inferences I make from these experiments are, that gypsum should be worked into the earth; that half a bushel or less to an acre, worked in, will improve land considerably; that drought can defeat its effects upon corn, but not upon the land, if it is covered; that the weather is of no consequence at the moment it is sown, though the subsequent season is of great; that it may vastly improve red clover even as late as May; that it increases the effects of coarse manure; that a quantity less than half a bushel to an acre, is in some cases as effectual as a much larger one; that excessive moisture or excessive drought destroys its effects; that its effect is more likely to be destroyed, when sprinkled on the surface, than when mixed with the earth; that sowing it broad-cast among Indian corn after it is up, may improve the crop 25 per cent; that sown in June, it may not improve English grass; that sown in August and covered, it may improve the land, though drought succeeds; that sown on wheat in November, it may neither benefit the wheat nor land: that about three pecks to the acre immediately sprinkled on clover seed sown on the surface, may cause it to come up, live, and thrive better; that a similar quantity sown on the surface in March, may treble the burden of bird-foot clover; that sown broad-cast from the 1st of January in breaking up or listing corn ground, the same quantity will probably add considerably to the crop; and that it may not improve the high land meadow oat if sown in February.

Young Men's Department.

ON THE FORMATION OF CHARACTER.

Fix upon a high standard of character. Or as it has sometimes been expressed, *determine to be somebody in the world.* To be *thought* somebody is not sufficient: the point you are to aim at, is to *be so.*

As a motive to this, let me urge in the first place, a regard to *your own happiness.* To this you are by no means indifferent at present. Nay, the attainment of happiness is your primary object. You seek it in every desire, word, or action. But you sometimes mistake the road that leads to it, either for the want of a friendly hand to guide you, or because you refuse to be guided. Or what is most common, you grasp at a smaller good, which is near, and apparently certain: and in so doing cut yourself off from the enjoyment of a good which is almost infinitely larger, though more remote.

Let me urge in the second place, a regard for the family to which you belong. It is true you can never fully know, unless the bitterness of ingratitude should teach you, the extent of the duty you owe to your relatives; and especially to your parents. You *cannot* know —at least till you are parents yourselves,—how their hearts are bound up in yours. But if you do not *in some measure know it,* till this late period, you are not fit to be parents. Hence, then, one evidence of the need in which you stand of the lessons of experience.

In the third place, it is due to society, particularly to the neighborhood or sphere in which you move, and to the *associations* to which you may belong, that you strive to attain a very great elevation of character. Here, too, I am well aware that it is impossible, at your age, to perceive fully, how much you have it in your own power to contribute, if you will, to the happiness of those around you; and here again let me refer you to the advice and guidance of aged friends.

But fourthly, it is due to the nation and age to which you belong, that you fix upon a high standard of character. This work is intended for American youth. *American!* did I say? This word, alone, ought to call forth all your energies, and if there be a slumbering faculty within you, arouse it to action. Never, since the creation, were the youth of any age or country so imperiously called upon to exert themselves, as those whom I now address. Never before were there so many important interests at stake. Never were such immense results depending upon a generation of men as upon that which is now approaching the stage of action. These rising millions are destined, according to all human probability, to form by far the greatest nation that ever constituted an entire community of freemen, since the world began. To form the character of these millions involves a greater amount of responsibility, individual and collective, than any work to which humanity has ever been called. And the reasons are, it seems to me obvious.

Now it is for you, my young friends, to determine whether these weighty responsibilities shall be fulfilled. It is for you to decide whether this *greatest* of free nations shall, at the same time, be the *best.* And as every nation is made up of individuals, you are each, in reality, called upon daily, to settle this question: "Shall the United States, possessing the most ample means of instruction brought within the reach of all her citizens, the happiest government, the healthiest of climates, the greatest abundance of the best and most wholesome nutriment, with every other possible means for developing all the powers of human nature, be peopled with the most vigorous, powerful and happy race of human beings which the world has ever known?"

There is another motive to which I beg leave for one moment to direct your attention. You are bound to fix on a high standard of action from the desire of obeying the will of God. *He* it is who has cast your lot in a country—which all things considered—is the happiest below the sun. *He* it is who has given you such a wonderful capacity for happiness, and instituted the delightful relations of parent and child, and brother and sister, and friend and neighbor. I might add, *He* it is too, who has given you the name *American,*—a name which alone furnishes a passport to many civilized lands, and like a good countenance, or a becoming dress, prepossesses every body in your favor. So that all the foregoing motives unite in one to swell the appeal to your feelings and increase the weight of your responsibility.

He who only aims at *little,* will *accomplish* but little. *Expect great things, and attempt great things.* A neglect of this rule produces more of the difference in the character, conduct, and success of men, than is commonly supposed. Some start in life without any leading object at all; some with a low one; and some aim high:—and just in proportion to the elevation at which they aim, will be their progress and success. It is an old proverb that he who aims at the sun, will not reach it to be sure; but his arrow will fly higher than if he aims at an object on a level with himself. Exactly so it is, in the formation of character.

Let me repeat the assurance that as a general rule, *you may be whatever you will resolve to be.* Determine that you will be something in the world, and you *shall be.* Young men seem to me utterly unconscious of what they are capable of being and doing. Their efforts are often few and feeble, because they are not awake to a full conviction that any thing great or distinguished is in their power.

But whence came an Alexander, a Cæsar, a Charles 12, or a Napoleon? Or whence the better order of spirits,—an Alfred, a Luther, a Howard, a Franklin, a Washington, a Rush! Were not these men once like yourselves? What but self-exertion, seconded by the blessing of heaven, ever placed their names high on the catalogue of human fame? Rely upon it,—what these men once *were* you *may be.* Not that the same individual may successfully imitate them all; but those of you who fix upon any one of them as a model, may be pretty sure of rising to the same, or a higher eminence. Resolution is almost omnipotent. These little words, *try,* and *begin,* are sometimes great in their results. "I cant," never accomplished any thing;—"I will try," has achieved wonders.

The positions I have here taken, in reference to human capabilities might be proved and illustrated by instances almost innumerable; but one only may suffice for the present.

A young man who had wasted, in a short time his patrimony, in profligacy, while standing, one day, on the brow of a precipice from which he had determined to throw himself, formed the sudden resolution to regain what he had lost. The purpose thus formed was kept; and though he began by shovelling a load of coals into a cellar, for which he only received twelve and a half cents, yet he proceeded from one step to another till he more than recovered his lost possessions, and died worth sixty thousand pounds sterling.

I have thus treated, at greater length than I intended, of the *motives*, which ought to persuade young men, especially of the present generation, *to set a high standard of action.* On the *means* by which you are to attain this elevation, it is the purpose of this little work to dwell plainly and fully. These *means* might be classed in three great divisions; viz. *physical, mental, and moral.* Whatever relates to the health, belongs to the first division; whatever to the improvement of the mind, the second, and the formation of good manners and virtuous habits, constitute the third.—*Young Man's Guide.*

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

Man is a compound being; his nature consists of two essential parts, body and mind. Each of these parts of the human constitution has its peculiar uses, and is susceptible of peculiar gratifications. The body is furnished with external senses, which are both the sources of pleasure and the inlets of knowledge; and the Creator has furnished the universe with objects fitted for their exercise and gratification. While these pleasures are directed by the dictates of reason, and confined within the limits prescribed by the Divine law, they are so far from being unlawful, that in the enjoyment of them, we fulfil one of the purposes for which our Creator brought us into existence. But the pursuits of sensitive pleasures is not the ultimate end of our being; we enjoy such gratifications in common with the inferior animals; and in so far as we rest in them as our chief good, we pour contempt on our intellectual nature, and degrade ourselves nearly to the level of the beasts that perish.

Man is endowed with intellectual powers, as well as with organs of sensation,—with faculties of a higher order, and which admit of more varied and sublime gratifications, than those which the senses can produce. By these faculties we are chiefly distinguished from the lower orders of animated existence; in the proper exercise and direction of them, we experience the highest and most refined enjoyments of which our nature is susceptible, and are gradually prepared for the employments of that immortal existence to which we are destined. The corporeal senses were bestowed chiefly in subserviency to the powers of intellect, and to supply materials for thought and contemplation; and the pleasures peculiar to our intellectual nature, rise as high above mere sensitive enjoyments, as the rank of man stands in the scale of existence above that of the fowls of the air, or the beasts of the forest. Such pleasures are pure and refined; they are congenial to the character of a rational being; they are more pemanent than mere sensitive enjoyments; they can be enjoyed when worldly comforts are withdrawn, and when sensual gratifications can afford no delight; they afford solace in the hours of retirement from the bustle of business, and consolation amid the calamities and afflictions to which humanity is exposed; and the more we acquire a relish for such pleasures, the better shall we be prepared for associating with intelligences of a higher order in a future world.

THE IGNORANT MAN.

Before proceeding to the more particular illustration of this topic, let us consider the state and enjoyments of the man whose mind is shrouded in ignorance. He grows up to manhood like a vegetable, or like one of the lower animals that are fed and nourished for the slaughter. He exerts his physical powers, because such exertion is necessary for his subsistence; were it otherwise, we should most frequently find him dosing over the fire, or basking in the sun, with a gaze as dull and stupid as his ox, regardless of every thing but the gratification of his appetites. He has perhaps been taught the art of reading, but has never applied it to the acquisition of knowledge. His views are chiefly confined to the objects immediately around him, and to the daily avocations in which he is employed. His knowledge of society is circumscribed within the limits of his parish, and his views of the world in which he dwells are confined within the range of the country in which he resides, or the blue hills which skirt his horizon. Of the aspects of the globe in other countries—of the various tribes with which they are peopled—of the seas and rivers, continents and islands which diversify the landscape of the earth—of the numerous orders of animated beings which people the ocean, the atmosphere, and the land,—of the revolutions of nations, and the events which have taken place in the history of the world, he has almost as little conception as the animals that range the forest, or bound through the lawns. In regard to the boundless regions that lie beyond him in the firmament, and the bodies that roll there in magnificent grandeur, he has the most confused and inaccurate ideas; and he seldom troubles himself with inquiries in relation to such subjects. Whether the stars be great or small, whether they be near us or at a distance, or whether they move or stand still, is to him a matter of trivial importance. If the sun give him light by day, and the moon by night, and the clouds distil their watery treasures upon his parched fields, he is contented, and leaves all such inquiries and investigations to those who have little else to engage their attention. He views the canopy of heaven as merely a ceiling to our earthly habitation, and the starry orbs as only so many luminous studs or tapers to diversify its aspect, and to afford a glimmering light to the benighted traveller. Of the discoveries which have been made in the physical sciences in ages past, of the wonders of creation which they have unfolded to view, of the instruments which have been invented for exploring the universe, and of the improvements which are now going forward in every department of science and art, and the prospects that are opening to our view, he is almost as entirely ignorant as if he had been fixed under the frozen pole, or chained to the surface of a distant planet. He considers learning as consisting chiefly in the knowledge of grammer, Greek and Latin; and philosophy and astronomy as the art of telling fortunes and predicting the state of the weather; and experimental chemistry, as allied to the arts of magic and necromancy. He has no idea of the manner in which the understanding may be enlightened and expanded, he has no relish for intellectual pursuits, and no conception of the pleasures they afford; and he sets no value on knowledge but in so far as it may tend to increase his riches and his sensual gratifications. He has no desire for making improvements in his trade or domestic arrangements, and gives no countenance to those useful inventions and public improvements which are devised by others. He sets himself against every innovation, whether religious, political, mechanical or agricultural, and is determined to abide by the "good old customs" of his forefathers, however irrational and absurd. Were it dependent upon him, the moral world would stand still as the material world was supposed to do in former times; all useful inventions and improvements would cease, existing evils would never be remedied, ignorance and superstition would universally prevail, the human mind would be arrested in its progress to perfection, and man would never arrive at the true dignity of his intellectual nature.

It is evident that such an individual (and the world contains thousands and millions of such characters) can never have his mind elevated to those sublime objects and contemplations which enrapture the man of science, nor feel those pure and exquisite pleasures, which cultivated minds so frequently experience; nor can he form those lofty and expansive ideas of the Diety which the grandeur and magnificence of his works are calculated to inspire. He is left as a prey to all those foolish notions and vain alarms which are engendered by ignorance and superstition; and he swallows, without the least hesitation, all the absurdities and childish tales, respecting witches, hobgoblins, spectres, and apparitions, which have been handed down to him by his forefathers in former generations. And while he thus gorges his mind with fooleries and absurdities, he spurns at the discoveries of science as impositions on the credulity of mankind, and contrary to reason and common sense. That the sun is a million of times larger than the earth, that light flies from his body at the rate of two hundred thousand miles in a moment of time, and that the earth is whirling round its axis from day to day, with a velocity of a thousand miles every hour, are regarded by him as notions far more improbable and extravagant than the story of the "Wonderful Lamp," and all the other tales of the "Arabian Nights Entertainments." In his hours of leisure from his daily avocations, his thoughts either run wild among the most grovelling objects, or sink into sensuality or inanity, and solitude and retirement present no charms to his vacant mind. While human beings are thus immersed in ignorance, destitute of rational ideas, and of a solid substratum of thought, they can never experience those pleasures and enjoyments, which flow from the exercise of the

understanding, and which correspond to the dignity of a rational and immortal nature.

THE LEARNED MAN.

On the other hand, the man whose mind is irradiated with the light of substantial science has views and feelings, and exquisite enjoyments to which the former is an entire stranger. In consequence of the numerous and multifarious ideas he has acquired, he is introduced as it were, into a new world, where he is entertained with scenes, objects and movements, of which a mlnd enveloped in ignorance can form no conception. He can trace back the stream of time to its commencement; and, gliding along its downward course, can survey the most memorable events which have happened in every part of its progress, from the primeval ages to the present day—the rise of empires, the fall of kings, the revolutions of nations, the battles of warriors, and the important events which have followed in their train—the progress of civilization, and of arts and sciences—the judgments which have been inflicted on wicked nations—the dawnings of Divine mercy towards our fallen race—the manifestation of the Son of God in our nature—the physical changes and revolutions which have taken place in the constitution of our globe—in short, the whole of the leading events in the chain of Divine dispensation, from the beginning of the world to the period in which we live. With his mental eye, he can survey the terraqueous globe in all its variety of aspects; contemplate the continents, islands, and oceans which compose its exterior, the numerous rivers by which it is indented, the lofty ranges of mountains which diversify its surface, its winding caverns, its forests, lakes, sandy deserts, ice-lands, whirl-pools, boiling springs, glaciers, sulphuric mountains, bituminous lakes, and the states and empires into which it is distributed, the tides and currents of the ocean, the icebergs of the polar regions, and the verdant scenes of the torrid zone. He can climb, in imagination, to the summit of the flaming volcano, listen to its subterraneous bellowings, behold its lava bursting from its mouths, and rolling down its sides like a flaming river—descend into the subterranean grotto—survey, from the top of the Andes, the lightnings flashing and the thunders rolling far beneath him—stand on the brink of the dashing cataract and listen to its roarings—contemplate the ocean rearing its billows in a storm, and the hurricane and tornado tearing up forests by their roots, and tossing them about as stubble. Sitting at his fireside, during the blasts of winter, he can survey the numerous tribes of mankind, scattered over the various climates of the earth, and entertain himself with views of their manners, customs, religion, laws, trades, manufactures, marriage ceremonies, civil and ecclesiastical government, arts, sciences, cities, towns and villages, and the animals peculiar to every region. In his rural walks, he can not only appreciate the beneficence of Nature, and the beauties and harmonies of the vegetable kingdom, in their exterior aspect, but can also penetrate into the hidden processes which are going on in the roots, trunks and leaves of plants and flowers, and contemplate the numerous vessels through which the sap is flowing from their roots through their trunks and branches, the millions of pores through which their odoriferous effluvia exhale, their fine and delicate texture, their microscopical beauties, their orders, genera and species, and their uses in the economy of nature.

FORMATION OF HABITS.

Success in life depends, in a great measure, on the early formation of our habits. Whether our grand object be wealth or fame, or that nobler one, exalted virtue, we must shape our habits to that object, or we shall fail. What enabled Franklin to obtain the highest honors of philosophic fame; to stand, as he expresses it, "before kings," and what is better, to live in the memory of his countrymen? The early formation of good habits. The perusal of his auto-biography, which no young man should omit, will show what those habits were. What made Girard the richest citizen of our country, and the benefactor of his race? The formation of early habits of frugality, disinterestedness and self-denial. Such habits are not formed in a day, nor will they result from a few faint resolutions. They are the result of continued effort.

Whatever is of value must, in most cases, be sedulously pursued. Seldom can it be caught in a moment, like a prize in the lottery, or brought to perfection like a mushroom in a few hours. Character most certainly is of slow growth. No method can force it, or hasten its ripening; like asparagus, so treated, it is sickly and without flavor. Only by long continuance, and unvaried, uninterrupted care, can this jewel be obtained, polished and set, so as to show itself to the best advantage. Not by accident, nor by fits and starts, but by regular, judicious and permanent habits, may a youth hope to obtain this important qualification, character.

Habit is either an insidious enemy, or a firm friend. We had need be much on our guard concerning its influence; rather let us enlist it and employ it judiciously; it will render us much assistance in forming a character useful, estimable and efficient.

THE CULTIVATOR—MAY, 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE GARDEN.

Though we do not intend to enter into the minute details of gardening, nor to say much of the ornamental portion of the art; yet we would fain encourage a taste for this branch of labor, which does much to multiply our comforts, and refine our manners, and proffer such occasional directions as may tend to benefit the generality of our readers. We go upon the principle that we all ought to look for our chief happiness *at home*; and that the more this home is embellished, and provided with the varied productions of the soil, the stronger will our attachments be to it, and the more multiplied will be our enjoyments. At all events, there are many productions of the garden which are, in a measure, indispensable in every family; and the farmer can raise them with more economy than he can buy them. It is in relation to the culture of these that we intend to offer some brief remarks.

Among the general rules which ought to be regarded in the management of a garden, and which in some measure apply to the management of a farm, we may particularize the following:

1. A garden should be enclosed by a secure fence—otherwise an unruly animal may destroy in a night the fruits of many a day's toil.

2. A garden should be rich; for here the maxim particularly applies—that it is better to cultivate a small piece of ground well, than a large one slovenly and bad. "*Well* done" is the only "*good enough*" for a garden.

3. Do not plant your roots and vines in the shade, or under the drippings of trees, but in an open exposure. Appropriate these situations to medicinal plants and herbs. Trees impoverish the ground, and their shade is baleful to most crops. Plant trees upon the north, east and west borders, where their shade will be but partially prejudicial, or along a main alley.

4. Alternate your crops; that is, do not plant your onions or other vegetables two successive years on the same quarter. This rule is as important to the garden as it is to the farm; and every farmer, at least every good farmer, knows, that alternating his farm crops is of the first importance to profit.

5. Plant your seeds when the ground is fresh dug or ploughed, when it is filled with atmospheric air, and moist and permeable to heat, three indispensable requisites to the vigorous germination of the seeds. They will then sprout quick, and grow luxuriantly.

6. Seeds require to be kept moist till their roots have got firm hold of the earth, and their leaves have expanded above it. To ensure this, the soil must be brought in close contact with them, and they sufficiently covered. A good precaution is to tread the fresh dug soil on the line where the seeds are to be planted, which retards evaporation from below; or, when the seeds are covered to a sufficient depth, to compress the earth upon them with a hoe, spade or board, which not only tends to retain the moisture, but to break the soil and to bring it in close contact with them. Seeds often fail to grow, or, having began to germinate, are dried and lost, for the want of moisture. And many small seeds with husky coverings, particularly flower seeds, have been declared bad, because they have been planted without due reference to this rule.

7. As soon as the plants are firmly rooted, the more the earth is stirred about them the better. This facilitates the preparation of the vegetable food in the soil, and greatly promotes growth. Next to the destruction of weeds, nothing concentrates the effects of drought so much, in garden or field, as stirring the surface of the soil.

8. Different seeds require different temperatures to induce germination; and if they are put into the ground when it is too cold, they are liable to rot. Wheat, rye, barley, &c. will germinate at 45°, corn at perhaps 55°, while the melon probably requires a heat of 60 to 70 degrees. The common bean will vegetate in a

cold temperature, while the Lima bean will rot in a cold or wet soil. Hence, in planting, regard is to be had to the hardiness of the plant which is to be sown.

The present month is an important one in the operations of the garden. If not already done, no time should be lost in sowing the seeds of onions, sallads, early cabbage, peas, radishes, and in planting some early corn and potatoes. The beet, carrot, parsnip, and summer squash may also be sown. Cabbages for winter use may be sown in time, from the 20th to the 30th. As soon as the soil and the season are warm enough to bring up corn, which here is generally from the 15th to the 20th, plant your melons, pumpkins, and cucumbers, though it will do equally well to plant the latter, for pickles, in the early part of June. The 15th will ordinarily do for Lima beans, which are the best of the bean family. Soak the seed of these in warm water, a few hours, and cover them slightly. My practice is to save this crop for winter use. They afford a great product. When frost is apprehended, the beans are all picked, the unripe ones shelled and dried; and, if soaked before cooking, are nearly as good as when first gathered from the vines. An acquaintance digs a large hole, in which he deposites a barrow of dung, which he covers with six inches of earth, and plants the Lima beans, and puts down poles upon the border of the manured circle. In this way they are said to grow luxuriantly, and to produce in great abundance. Of the pumpkin, there are several new and much esteemed varieties, as the Valparaiso, Porter and acorn squashes. These are rather later in coming to maturity than the old yellow kind; though they have been successfully cultivated among corn. We would commend the planting out, or sowing seeds of parsley, balm, wormwood, tanzy, garlick, hyssop, rue, sage, thyme and other herbs which are often required in a family. B.

The Plum Tree is subject to a disease called canker, cancer and by various other names, which destroys thousands. It is a kind of vegetable gangrene, if the term may be allowed, which, if not timely arrested, generally proves fatal to the tree. It is a vegetable excrescence, upon the stock or limbs, at first green, and afterwards becoming black. The affected branch soon dies, and the whole tree gradually perishes. It is generally supposed to be caused by some insect whose poison, injected into the tree, vitiates the sap. The only preventive known to prove successful, is to cut off all the diseased parts, as soon as it appears, and commit it to the fire. This plan has been adopted in the writer's garden, and in the Albany nursery, for some years; and hardly an instance of the disease occurs in a season.

The Peach Tree is often destroyed by a grub which preys upon the bark of the root, the eggs of which are said to be deposited about midsummer. The maggot works a passage down through the inner bark, below the surface of the ground, where it remains secure for the winter. There are two ways, and perhaps more, of preventing or remedying this evil; one is to surround the collar of the tree with something which will destroy the insect; the other, to cover the lower part of the tree, during summer, so that the fly cannot deposite its eggs near the ground. Lime and ashes laid around the tree at the surface of the ground, have been found efficacious in destroying the grub, as the rains, which saturate these, become strongly impregnated with alkali, find a passage into the holes and kill the insect. The other is most readily effected by straw, the buts buried in the ground, set upright round the tree and secured to it by two or more straw bands. If the egg is deposited above this, and the straw removed in autumn, the grub, not having reached the ground, is destroyed by the cold of winter.

Lucerne, (*medicago sativa*,) sometimes called French clover, may be advantageously cultivated on farms adapted to its growth, to be used either in *foiling* farm stock, as cows, horses, pigs, &c. that is, to be cut and fed green in the yard or stable, or as auxiliary to pasture. No crop gives so great a product of forage during the summer, and all domestic animals are fond of and thrive upon it. It is in condition to cut from the 15th to 20th May, and will give three or four cuttings in a season. An acre of good lucerne will keep six cows well from the first cutting; and as soon as the whole has been cut over to supply this number with food, the earliest mown will be fit to cut a second time. I have cultivated lucerne ten or a dozen years, and it has been almost my whole dependence for the summer support of my cows and a yoke of oxen. An acre has been worth to me fifty dollars a year. But to ensure a profitable crop, certain requisites are necessary, some of which I will name.

Lucerne must be sown on a dry soil. The roots penetrate four to six feet, and these will neither grow nor live where there is water. Sand, gravel or loam are the best soils for it.

It should be sown on a rich and clean soil. Without the first the crop will be diminutive; and if weeds abound, they will rob and choke the young lucerne, which is feeble during its early growth. The best preparation for it is a crop of potatoes, well manured and well cleaned in tilling.

Sow 16 pounds to the acre, broadcast, with half a bushel of winter rye, early in May, in ground well pulverized, harrow in the seed, and follow with the roller. Or the seed may be put in with a drill barrow, at 12 to 18 inches between the drills, at the rate of 10 lbs. the acre, and in this case the intervals should be kept clean with the hoe, or otherwise. The duration of lucerne is 6 to 10 years; though it sometimes, like clover, suffers from the winter. The seed may be had at the seed shops in our cities at 25 to 30 cents per pound.

To make lucerne into hay, it should lie in the swath to wilt and then be put into small grass cocks, with a fork (not rolled) to cure. After standing a day or two, the cocks may be opened two or three hours, under a bright sun, the hay turned, and soon after housed. If spread, like ordinary grass, the leaves dry and crumble ere the haulm or stalks are cured, and thus the best part of the fodder is lost. I have mixed lucerne, partially cured, in alternate strata with dry barley straw, on the mow, and found that cattle greedily consumed both, in winter, when fed out in the yard. B.

THE DRUNKEN FARMER.

It is important to every young farmer to establish habits of industry and sobriety. The former will lead to wealth, and the latter ensure its enjoyment. Our habits, for good or evil, are easily formed, but when once established, are very difficult to change. In early life is the time to guard against a propensity for drinking; for a taste for liquor once acquired, the fruits of the past are squandered, and the prospect of the future is only poverty and suffering. No matter how fortunate the man has been in life, in the acquisition of wealth or reputation—no matter how strong and numerous are the ties of friendship or connexion, nor with what endearments he is surrounded and blest—the habit of intemperance once formed, he may bid an eternal farewell to all that has heretofore constituted his highest enjoyment—to all that has made toil a pleasure and himself the envy of the malignant, and the boast of his friends—he has now had to the full his draught of felicity—he has nothing hereafter to anticipate, but a life of degradation for himself—a trial of endurance and suffering for his family—and, to his friends he has now become an object of painful reflection and remark. It is right it should be so. The act on his part is voluntary. He has renounced all these ties and enjoyments, for the most beastly intoxication; and if the world and friends desert him, he deserves his fate, because he has rendered himself unfit to associate with those whose reason has not been impaired by so gross an indulgence. Farmers, avoid intemperance as you would the approach of cholera; for as certainly as you become its victim, your farms will be taken from you, and your wretched families become the dependants of others. You have only to lood around you, and see these observations exemplified in numerous instances: for you can sit by your firesides, and soon name this man and that man, and yet another and another, who started in life perhaps with much better prospects than yourselves, but who are now laborers for others, or, what is still worse, dependants upon your alms-houses for their bread and shelter. The establishment of little groceries, or taverns, in a small neighborhood of farmers, has a most injurious tendency. Often have we known sober men, ignorantly, and apparently innocently, plead for them as a convenience; but as often have we seen these same men become their most willing but unsuspecting victims. As soon as one of these establishments is opened in a small but thriving agricultural community, it becomes the scene of revelry for the young, and the place of resort of the old. There they congregate to spend their evenings, to hear the news, to attend trifling lawsuits, to buy small necessaries for their families, and the thousand other occasions that they can find excuses for;—but at each time they meet a friend, and they must either treat or be treated. The taste for liquor and company is soon acquired, and then their ordinary business becomes irksome; they lose their relish for labor; the farm is neglected; the family is

badly provided for; and in the lapse of a few years debts have accumulated, creditors become pressing, and the homes of their wives and little ones, and perhaps of their fathers, must be given up to strangers for ever. Besides the personal injury these establishments are the causes of, they are of the most demoralizing tendency in a neighborhood; they soon become places of Sunday resort, and men who had previously been in the habit of attending divine service in the nearest meeting-house, will soon lose their taste for these goodly observances, will make this the place of their Sunday gatherings, and as vice or virtue is always progressive, in the course of a little time they will forget that the Sabbath was made as a day of rest. At first they engage in conversation and drinking; from drinking they go to pitching quoits, to ball playing, to horse racing and gambling. Fishing and gunning are amusements too innocent, when compared with the others, even to be named. These are evils not ideal;—again and again have we seen them exemplified in all their reality; and however diversified the pursuits of those who engaged in the practices, one result, that is ruin, has happened to all. We will illustrate these observations by only a single one out of many cases, and if the narration should interest any of our readers sufficiently to make the story impressive, we hope its effects will not be lost upon them or their neighbors.

We knew a farmer who in early life came into possession, partly by industry and partly by inheritance, of a farm of 300 acres of first rate land. He married a woman well adapted to his business and prospects, and who faithfully and affectionately discharged all her duties. He became the parent of a numerous family, principally sons, but his farm afforded all an ample maintenance, and by his industry, good temper and prosperity, his life appeared to be one, if possible, of perfect contentment, for every want seemed to be supplied, and every desire gratified. The earth yielded to him of her abundance, and the appearance of his house, farm and family, every thing around him, betokened comfort and future wealth. As to creditors there were none. Years passed in this way, his sons began to approach manhood. An unnecessary tavern was now established in his neighborhood, under pretence of accommodating travellers, but in reality to draw in the unthinking. He called occasionally to see his neighbor the landlord, and when he called found the host so sociable that he could not hastily leave him, and certainly not without giving him something for the entertainment he had afforded him. At times too, when he called, he found a few of his neigbbors there, and they must sit down together, to talk upon religion, politics, or the news of the day, and be sure not to forget to pay the landlord for putting up a sign for their accommodation. Thus evenings were occasionally spent, and they afforded subjects for reflection the following day, but when evening came again there was a desire to spend it in the same place. The inclination was at first only occasionally indulged, but it soon settled down into a habit, and if one was now and then omitted, it was not from a want of desire. These evening sittings became by degrees later and later; the family were kept up by them, and to make them shorter a son was often sent to remind his father that it was late, and all the family in bed, except the messenger and his anxious mother, who was waiting his return. Still he would linger; he could not yet leave his interesting companions; he must have another talk and its necessary accompaniment, another glass; the night was long and he could sleep enough before morning. In this way he would beguile time, persuade his son to stay a little, and yet a little longer—urge him too to taste the landlord's good cheer, until the son from his oft-repeated visits to the tavern to fetch his father home, became pleased with the company, and took his share of the evening's good cheer. As the eldest son in time proved recreant to the mother's injunctions, and did not shorten his father's visits to the tavern, a younger was selected to supply the place of the first, who, from his tender years and habits of going early to bed, and urgent entreaties, might persuade the father, at a more seasonable time, to return to his home. He too was detained by a thousand artifices, until either the lateness of the hour, or his importunities, at last prevailed. The father permitted him too to taste until liquor became not unpleasant, nor the effect forgotten. A few years rolled on in this way; the father became a confirmed drunkard; the whole business of the farm devolved on the wife, for the eldest son had by this time become almost worthless. The constitution of the parent was at length broken down. He became sensible that intemperance had taken a fatal hold upon him—he resolved to break up the habit—he persevered for a short time, gave evidences of reform and returning health; but alas! he once more gave way, and was soon after laid in the grave. Before his death, he frequently spoke of the cause of his ruin; "that his example might be fatal to his sons; of the injury he had done to all his children; and the sufferings he had occasioned his unhappy wife." By his neglect too of his business, a debt had been entailed on his estate. All these were painful reflections, and his own conduct the cause of them. Some time before his death, his whole manner towards his family had become changed; instead of being the kind and affectionate husband and parent, of which we had often been the witness, how did our soul shudder, when once in a state of intoxication, we saw him transformed into a demon of meditated cruelty. It was on a cold day of December, when of all times in the year, home feels the most comfortable, we saw this man just returned from the tavern, pursuing his submissive wife with one child in her arms, and another following, around his own house, with an axe in his hand, threatening and swearing he would kill them all. How terrible the effects of intemperance! The kindest temper it endues with the ferocity of the tiger—the best friends become objects of hatred and vengeance; and after having deprived us of all that is dear in life, the relish for it still increases, until it strikes down its victims, and whole families become beggared by the fatal indulgence. Within one short year, the eldest son was laid in the grave by the side of his father. The taste for liquor had been so early cultivated, that he soon gave way to the temptation, and as he was yet in the green tree, his constitution was the sooner undermined. But the effects of early initiation did not end here: a third victim was preparing, and in two more years the second son, who was coming into manhood, and who, when a boy, had been sent too often to the tavern to bring home an inebriated father, he too had acquired the fatal propensity, and was now in a due course of preparation for the tomb. The anxious mother had one time hopes of reform, and she said it was at that time some comfort to her that he drank daily *only* two quarts of cider brandy. These were her own words, and she spoke them in the sincerity of her feelings. In a little time this son became to all but her an object of filth and loathing, for an uncontrollable diarrhœa rendered his room and presence insupportable. The end need not be told. Up to this period it was often thought necessary for these sufferers to have the occasional use of liquor, It had become, therefore, almost a family store, and two younger sons, from having been frequently sent to procure it, became somewhat familiar with its use and effects. The last victim had hardly been sacrificed, before another brother gave indications that he too had acquired a passion for drinking, and as his constitution was different from the others, it soon changed him into a maniac, and he is now confined in the asylum of the insane. The faithful wife and mother has struggled on through all these trying difficulties with a patience that was never exhausted, and a feeling and fidelity worthy of all commendation. By her industry and good management, she has been enabled in a measure to keep the estate, and make the rest of her family comfortable.

The above narration is literally true. The misfortune is, that with similar scenes we are all too familiar. A.

Drain-Plough.—We have received a communication from *John S. Greene*, of Utica, recommending that a subscription of $200 be raised, and awarded as a premium to the inventor of the best drain-plough which shall be exhibited at the Albany Cattle Fair, in October, and authorizing us to subscribe two dollars in his behalf towards such fund. For ourselves we are free to say, that we consider underdrains better, and in the end cheaper, than open drains, to free wet and springy soils from water; and that where open drains are necessary to carry off a large quantity of water, they should be made with the spade, and well made. Underdrains cause no waste of land; open drains occasion much waste, and are, particularly if opened with a plough, unsightly upon a farm.

The Caterpillar, which is so unsightly in our orchards at this season of the year, to say nothing of the injury it does to the foliage, and consequently to the tree—is easily destroyed, if taken in time, and at the proper time. Early in the morning, and in wet weather, at this season they may be found concentrated in a small compass, under their web. If within reach, the whole colony may be crushed in a moment with the hand. To reach the more elevated webs, wind the end of a pole with rags, and with this destroy them. Or, what is better, affix a Pickering brush to the end of the pole, and with this remove and destroy them. This brush is round and coni-

cal, somewhat resembling a battle brush. A man or boy will clear an orchard of this pest before breakfast; and the operation may be repeated, if necessary, without expense, or much loss of time.

Tillage Husbandry.

ON THE CORN CROP.

From the Proceedings of the N. Y. State Agricultural Society.

BY J. BUEL.

There is no crop more beneficial to the American farmer than Indian corn. An eminent agriculturist, the late John Taylor of Virginia, called it the "meal, meadow and manure" of the farm. It is convertible into human food in more forms than any other grain; its value in fattening domestic animals is not exceeded by any product of the farm; and no crop returns more to the soil than this does in the form of manure. There are two important requisites, however, to its *profitable* cultivation. The first is, that the soil be adapted to its growth; and the second, that the crop be well fed and well tended; for food and attention are as important to the plant, as to the animal. Ordinarily speaking, it costs less to take care of a good crop of corn, on proper corn land, than it does of a bad crop on land not adapted to its culture. The first is light and dry. The latter stiff, wet or grassy. I put the average expense of cultivating and securing an acre at $15, (a) including a fair rent, though it ordinarily exceeds this sum. The farmer, therefore, who obtains thirty bushels from the acre, estimating the grain at 50 cents per bushel, gets a fair compensation for his labor, and the use of his land. Whatever the product falls short of this is an absolute loss; and whatever it may exceed it is nett gain. Thus the man who gets but twenty bushels from the acre, loses, upon this estimate, $20 worth of his labor, on four acres. He who raises 80 bushels an acre, on the other hand, realizes a nett profit of $100 from four acres—making a difference in the profits of the two farmers in the management of four acres of corn, of *one hundred and twenty dollars!* These data are sufficiently accurate to show the importance of the two requisites I have suggested, and the value of a little calculation in the business of farming. The habit of noting down the expense, as well as the product of a crop, and thus ascertaining the relative profit and loss, is highly advantageous to the practical farmer, and one which cannot be too strenuously inculcated. It will perhaps be said, that I ought to add the value of the manure which is employed in the large crop; but I reply, that I offset this against the increased forage which this crop furnishes. Besides, by applying the manure in the unfermented state in which it is generally found in the spring, it will be as beneficial to the succeeding crops, as though it had lain and fermented in the yard, and been applied in the usual way in the autumn.(b)

The soils adapted to the culture of Indian corn, are such as are permeable to heat, air,(c) and the roots of the plant, and embrace those denominated sandy, gravelly and loamy. Corn will not succeed well on grounds that are stiff, hard or wet. The roots grow to as great length as the stalks, and the soil must be loose to permit their free extension.

The manures used are generally yard and stable dung, and plaster of Paris, (*sulphate of lime.*) The first ought to be abundant; as upon the fertility which it induces, depends the profit of the crop. Long or unfermented manure is to be preferred. It decomposes as the wants of the plant require it; while its mechanical operation, in rendering the soil light and porous, is beneficial to the crop. It should be equally spread over the whole surface, before it is ploughed under. It then continues to afford fresh pasture to the roots till the corn has matured, and is in its place to benefit the succeeding crop. If put into the hills, the roots soon extend beyond its influence, it does not so readily decompose, and the subsequent crop is prejudiced from its partial distribution in the soil. In a rotation of four or five years, in which this crop receives the manure, twenty-five or thirty ordinary loads may be applied to *one* acre with greater profit, than to *two* or *three* acres. Every addition tells in the product; and there is scarcely any danger of manuring too high for this favorite crop. Gypsum is applied broadcast before the last ploughing or harrowing, or strewed on the hills after hoeing. I pursued the first method, at the rate of a bushel to the acre. (d)

The best preparation for a corn crop is a clover or other grass lay, or lea, well covered with a long manure, recently spread, neatly ploughed, and harrowed lengthwise of the furrow. A roller may precede the harrow with advantage. The time of performing these operations depends upon the texture of the soil, and the quality of the sod. If the first is inclining to clay, or the latter tough or of long continuance, the ploughing may be performed the preceding autumn; but where sand or gravel greatly preponderate, or the sod is light and tender, it is best performed in the spring, and as near to the planting as convenient. The harrow at least should immediately precede planting. All seeds do best when put into the fresh stirred mould. Stiff lands are ameliorated and broken down by fall ploughing; but light lands are rather prejudiced by it. When corn is preceded by a tilled crop, the ground should be furrowed, and the seed deposited in the bottoms of the furrows. Where there is a sod, the rows should be superficially marked, and the seed planted upon the surface. Where the field is flat, or the sub-soil retentive of moisture, the land should be laid in ridges, that the excess of water which falls may pass off in the furrows.

The time of planting must vary in different districts and in different seasons. The ground should be sufficiently warmed by vernal heat to cause a speedy germination. Natural vegetation affords the best guide. My rule has been to plant when the apple is bursting its blossom buds, which has generally been between the 12th and 20th of May.

Preparation of the seed. The enemies to be combated are the wire-worm, brown grub, birds and squirrels. Of these the first and two last prey upon the kernels, and against these tar offers a complete protection. I soak my seed 12 to 20 hours in *hot* water, in which is dissolved a few ounces of crude salt petre, and then add (say to 8 quarts of seed) half a pint of tar, previously warmed and diluted with a quart of warm water. The mass is well stirred, the corn taken out, and as much plaster added as will adhere to the grain. This impregnates and partially coats the seed with the tar. The experience of years will warrant me in confidently recommending this as a protection for the seed.

The manner of planting is in ordinary hills, from two and a half to six feet apart, according to the variety of corn, the strength of the soil, and the fancy of the cultivator. The usual distance in my neighborhood is three feet. Some, however, plant in drills of one, two and three rows, by which a greater crop is unquestionably obtained, though the expense of culture is somewhat increased. (e)—*The quantity of seed* should be double, and may be quadruple (f) what is required to stand. It is well known that a great difference is manifest in the appearance of the plants. Some appear feeble and sickly, which the best nursing will not render productive. The expense of seed, and the labor of pulling up all but three or four of the strongest plants in a hill, it is believed will be amply remunerated by the increased product. If the seed is covered, as it should be, with fine mould only, and not too deep, we may at least calculate upon every hill or drill having its requisite number of plants.

The after culture consists in keeping the soil loose and free from weeds, which is ordinarily accomplished by two dressings, and in thinning the plants, which latter may be done the first hoeing, or partially omitted till the last. The practice of ploughing among corn, and of making large hills, is justly getting into disrepute: for the plough bruises and cuts the roots of the plants, turns up the sod and manure to waste, and renders the crop more liable to suffer by drought. The first dressing should be performed as soon as the size of the plants will permit, and the best implement to precede the hoe is a corn harrow, adapted to the width of the rows, which every farmer can make. This will destroy most of the weeds and pulverize the soil. The second hoeing should be performed before or as soon as the tassels appear, and may be preceded by the corn harrow, a shallow furrow of the plough, or what is better than either, by the cultivator.(g) A slight earthing is beneficial, providing the earth is scraped from the surface, and the sod and manure not exposed. It will be found beneficial to run the harrow or cultivator a third, and even a fourth time, between the rows, to destroy weeds and loosen the surface, particularly if the season is dry. (h)

In harvesting the crop one of three modes is adopted, viz: 1.—The corn is cut at the surface of the ground, when the grain has become glazed, or hard upon the outside, put immediately into stooks, and when sufficiently dried, the corn and stalks are separated, and both secured. 2. The tops are taken off when the corn has become glazed, and the grain permitted to remain till October or November upon the buts. Or, 3. Both corn and stalks are left standing till the grain has fully ripened, and the latter become dry, when both are secured. There are other modes, such as leaving the buts or entire stalks, in the field, after the grain is gathered; but

these are so wasteful and slovenly as not to merit consideration. The stalks, blades and tops of corn, if well secured, are an excellent fodder for neat cattle. If cut, or cut and steamed, so that they can be readily masticated, they are superior to hay. Besides, their fertilizing properties, as a manure, are greatly augmented by being fed out in the cattle yard, and imbibing the urine and liquids which always there abound, and which are lost to the farm, in ordinary yards, without an abundance of dry litter to take them up. By the first of these methods, the crop may be secured before the autumnal rains; the value of the fodder is increased, and the ground is cleared in time for a winter crop of wheat or rye. The second mode impairs the value of the forage, requires more labor, and does not increase the quantity, or improve the quality, of the grain. The third mode requires the same labor as the first, *may* improve the quality of the grain, but must inevitably deteriorate the quality of the fodder. The corn cannot be husked too promptly after it is gathered from the field. If permitted to heat, the value of the grain is seriously impaired.(i)

Sowing seed. The fairest and soundest ears are either selected in the field, or, at the time of husking, a few of the husks being left on, braided and preserved in an airy situation till wanted for use.

In making choice of sorts, the object should be to obtain the varieties which ripen early, and afford the greatest crop. I think these two properties are best combined in a twelve rowed kind which I obtained from Vermont some years ago, and which I call Dutton corn, from the name of the gentleman from whom I received it. It is earlier than the common eight rowed yellow, or any other field variety I have seen, and at the same time gives the greatest product. I have invariably cut the crop in the first fourteen days of September, and once in the last week in August. The cob is large, but the grain is so compact upon it, that two bushels of sound ears have yielded five pecks of shelled grain, weighing 62 lbs. the bushel.

In securing the fodder, precaution must be used. The buts become wet by standing on the ground, and if placed in large stacks, or in the barn, the moisture which they contain often induces fermentation and mouldiness. To avoid this I put them first in stacks so small, that the whole of the buts are exposed upon the outer surface; and when thoroughly dry they may be taken to the barn, or left to be moved as they are wanted to be fed out—merely regarding the propriety of removing a whole stack at the same time.

NOTES.

(*a*) *Estimated expense of cultivating an acre of Indian Corn:*

One ploughing, (suppose a clover lay,)	$2 00
Harrowing and planting, ...	2 00
Two hoeings, 4 days and horse team, ...	3 75
Harvesting, 2 days, ...	1 50
Cutting and harvesting stalks, ...	1 50
Rent, ...	5 00
	—— $15 75

(*b*) Stable and yard manures lose 50 per cent by the fermentation they undergo in the yard during the summer. This loss consists of the gases which are evolved in the process of rotting, and of the fluids which sink into the earth, or are carried off by the rains. Plants receive their food either in the gaseous or liquid form. If manure rots in the soil, neither these gases or fluids are lost: the earth retains, and the roots of the plants imbibe them. Yet recent manures are not proper to be applied to small grains. They cause too rank a growth of straw, and are apt to induce rust and mildew. Thus a crop of corn, potatoes or ruta baga may be *fed* and *fattened*, if I may use the expression, upon the dung which is destined to nourish the wheat crop, without deteriorating its value for the latter purpose, if it is applied to the corn, &c. before it has fermented.

(*c*) We are on the northern border of the maize zone, and should make up for defect in climate by selecting soils into which the heat readily penetrates. Air, besides conveying warmth in summer, imparts fertility by the vegetable food which is always suspended in it in the form of gases. Dews are also charged with these properties of vegetable nutriment, and when the soil is porous, they settle down as in a sponge, and impart fertility to the roots, (the true mouths,) of plants.

(*d*) I adopt the opinion of Davy, as the *modus operandi* of plaster of Paris, that it forms a necessary constituent of plants which it benefits, and is of no direct benefit to plants which do not afford it on analysis. Among the first are the clovers, corn, potatoes, and generally such plants as have broad or succulent leaves; while the latter embrace culmiferous grains and grasses, as wheat, rye, timothy, &c. Critical observation for years has confirmed me in this conclusion. Gypsum must be rendered soluble before it can be taken up by the mouths of plants, and it requires 600 parts of water to dissolve one of this mineral. I infer from these facts, that by burying it in the soil, it more readily dissolves, and is more accessible to the mouths of plants, than if spread upon the surface of the ground. I am induced, from these views of the subject, to sow plaster, on grass grounds, in March, and upon corn and potato grounds before the last ploughing for these crops. The latter was recommended and practised by the distinguished agriculturists, the late Mr. Taylor of Virginia, and Judge Peters of Pennsylvania.

(*e*) The following table exhibits the difference in product of various methods of planting, and serves also to explain the manner in which large crops of this grain have been obtained. I have assumed in the estimate, that each stock produces one ear of corn, and that the ears average one gill of shelled grain. This is estimating the product low; for while I am penning this (October,) I find that my largest ears give two gills, and 100 fair ears half a bushel of shelled corn. The calculation is also predicated upon the supposition, that there is no deficiency in the number of stocks, a contingency pretty sure on my method of planting.

	Hills.	bush.	qts.
1. An acre in hills, 4 feet apart, each way, will produce	2,722	42	16
2. The same, 3 by 3 feet, ...	4,840	75	20
3. The same, 3 by 2½ feet, ...	5,808	93	28
4. The same, in drills at 3 feet, plants 6 stalks, inch apart, in the drills, ...	29,040	113	14
5. The same in do. 2 rows in a drill, 6 in. apart, and the plants 9 inches, and 3 feet 9 inches from centre of drills, thus, ...	30,970	120	31
. . . .			
. . . .			
6. The same in do. 3 rows in a drill, as above, 3 feet from centre of drills, ...	43,560	170	5
. . . . .			
. . . . .			

The fifth mode I have tried. The ground was highly manured, the crop twice cleaned, and the entire acre gathered and weighed accurately the same day. The product in ears was 103 baskets, each 84 lbs. nett, and 65 lbs. over. The last basket was shelled and measured, which showed a product on the acre of 118 bushels 10 quarts. I gathered at the rate of more than 100 bushels the acre, from four rods planted in the third method, last summer; the result ascertained in the most accurate manner. Corn shrinks about 20 per cent after it is cribbed. The sixth mode is the one by which the Messrs. Pratts, of Madison county, obtained the prodigious crop of 170 bushels per acre. These gentlemen, I am told, are of opinion, that the product of an acre may be increased to 200 bushels.

(*f*) I am told the Messrs. Pratts, above alluded to, used seven bushels of seed to the acre, the plants being subsequently reduced to the requisite number.

(*g*) The cultivator is made in the form of a triangular harrow, with two bulls; or if intended to be graduated to different width, a centre bull is added, to which the exterior ones are attached by hinges. Iron slats, fixed to the exterior bulls, pass through a mortice in the centre one, perforated with holes, through which an iron pin passes to hold them at the graduated width. The teeth may be in any approved form, or reasonable number. The cultivator I use has five teeth, two in each of the outward, and one upon the centre timber. The teeth have a stout shank, with a duck's foots termination, four inches broad, somewhat cylindrical, rounded at the point, and inclined forward in an angle of 30 or 40°. This implement is useful for other purposes; and may be used, like Beatson's, as a substitute for the plough, in preparing light soils for a crop. The handles are attached to the centre piece. The teeth have a shoulder, on the under side of the timber, and are fastened with screws and nuts above.

(*h*) Some entertain a mistaken notion, that it is prejudicial to stir the soil among corn in dry weather, and others that weeds serve to prevent the evaporation of moisture by a hot sun. The reverse of these opinions is true. The exhaustion of moisture by a plant is in the ratio of the surface of its leaves and stocks presented to the sun and air.

(i) The leaves are the necessary organs for elaborating the food of plants, and when these are taken away the plant must cease to grow. The sap is useless until it undergoes elaboration in the leaves. Hence, when corn is topped in the usual way, the supply of food is cut off from the grain, except what may be elaborated in the husks. On comparing corn gathered by the first and second modes, it was the opinion of those who assisted in husking, that the first was soundest, brightest and heaviest. The third mode I have not tried. But it seems probable, that the grain might acquire an increase of volume, though it would lose again by depredation and waste. The first method has these further advantages that it preserves the cob from being saturated with rains, and secures the fodder, when it is in its highest perfection and greatest quantity.

Science of Agriculture.

PLOUGHING.

Ploughing is justly considered the most important of agricultural operations, as on the manner in which this is performed, depends the facility of executing all succeeding operations on the same piece of land. The manual operation of holding the plough in a proper position, and directing the horses or cattle which draw it at the same time, is only to be acquired by experience; when once attained it is perhaps one of the most agreeable and healthy of agricultural exercises, the body being kept upright, the arms and legs being brought into action, and also the eye and the mind, to keep the furrow straight, and of regular width and depth, and the voice to speak to the horses.

Three different points require particular attention in ploughing: 1st, The breadth of the slice to be cut; 2d, its depth; and 3d, the degree in which it is to be turned over;—which last circumstance depends both upon the construction of the plough, particularly the mould-board, and the care of the ploughman.

The breadth and depth of the furrow-slice are regulated by judiciously placing the draught on the nozzle or bridle of the plough; setting it so as to go more or less deep, and to take more or less land or breadth of slice, according as may be desired. In general, the plough is so regulated that, if left to itself, and merely kept from falling over, it would cut a little broader and a little deeper than is required. The coulter is also placed with some inclination towards the left or land side, and the point of the stock or share has a slight tendency downwards.

The degree to which the furrow-slice turns over, is in a great measure determined by the proportion between its breadth and depth, which for general purposes, is usually as three is to two, or when the furrow is nine inches broad it ought to be six inches in depth. When the slice is cut in this proportion, it will be nearly half turned over, or recline at an angle of forty or forty-five degrees; and a field so ploughed will have its ridges longitudinally ribbed into angular drills or ridglets. But if the slice is much broader in proportion to its depth, it will be almost completely overturned, or left nearly flat, with its original surface downwards; and each successive slice will be somewhat overlapped by that which was turned over immediately before it. And finally, when the depth materially exceeds the width, each furrow-slice will fall over on its side, leaving all the original surface bare, and only laid somewhat obliquely to the horizon.

Ploughing with the breadth and depth nearly in the proportion of three to two, is best adapted for laying up stubble land after harvest, when it is to remain during winter exposed to the mellowing influence of frost, preparatory to fallow or turnips.

The shallow furrow of considerable width, as five inches in depth by eight or nine wide, is understood to answer best for breaking up old lays, because it covers up the grass turf, and does not bury the manured soil.

Ploughing with the depth of the furrow considerably exceeding the width, is a most unprofitable and uselessly slow operation, which ought seldom or never to be adopted.

The most generally useful breadth of a furrow-slice is from eight to ten inches, and the depth, which ought to be seldom less than four inches, except in soils uncommonly thick and fertile. When it is necessary to go deeper, as for carrots and some other deep rooted plants, a trench ploughing may be given by means of a second plough following in the same furrow.

Shallow ploughing ought always to be adopted after turnips are eaten on the ground, that the manure may not be buried too deep; and also in covering lime—especially if the ground has been pulverized by fallowing, because it naturally tends to sink in the soil. In ploughing down farm-yard dung, it is commonly necessary to go rather deep, that no part of the manure may be left exposed to the atmosphere. In the first ploughing for fallow or green crops, it is advisable to work as deep as possible, and no great danger is to be apprehended, though a small portion of the sub-soil be at that time brought to the surface.

The furrow-slices are generally distributed into beds, varying in breadth according to circumstances; these are called *ridges or lands,* and are divided from one another by gutters or open furrows.—These last serve as guides to the hand and eye of the sower, to the reapers, and also for the application of manures in a regular manner. In soils of a strong or retentive nature, or which have wet, close subsoils, these furrows serve likewise as drains for carrying off the surface water, and being cleared out, after the land is sowed and harrowed, have the name of *water-furrows,*

Ridges are not only different in breadth, but are raised more or less in the middle, on different soils. On clayey retentive soils, the great point to be attended to is the discharge of superfluous water. But narrow ridges or *stitches* of from three to five feet, are not approved of in some of the best cultivated counties. In these a breadth of fifteen or eighteen feet, the land raised by two gatherings of the plough, is most commonly adopted for such soils; such ridges being thought more convenient for manuring, sowing, harrowing, and reaping, than narrower ones; and the water is drained off quite as effectually.

Ridges on dry porous turnip soils, may be formed much broader; and were it not for their use in directing the laborers, may be, and sometimes are, dispensed with altogether. They are often thirty or thirty-six feet broad, which in Scotland are called *ban-win* ridges, because reaped by a band of shearers, commonly six, served by one binder. If it be wished to obliterate the intermediate furrows, this may be done by casting up a narrow ridgelet, or single bout ridge, between the two broad ridges, which is afterwards levelled by the harrows.

The mode of forming ridges straight, and of uniform breadth, is as follows: let us suppose a field perfectly level, that is to be laid off into ridges of any determinable breadth. The best ploughman belonging to the farm conducts the operation, with the aid of three or more poles, shod with iron, in the following manner: The first thing is to mark off the head ridges, on which the horses turn into ploughing, which should in general be of an equal breadth from the bounding lines of the field, if these lines are not very crooked or irregular. The next operation, assuming one straight side of the field, or a line that has been made straight, as the proper direction of the ridges, is to measure off from it with one of the poles, half the intended breadth of the ridge, if it is to be gathered, or one breadth and a half, if to be ploughed flat; and then the ploughman sets up a pole as a direction for the plough to enter. On a line with this, and at some distance, he plants a second pole, and then in the same manner a third, fourth, &c. as the irregularity of the surface may render necessary, though three must always be employed—the last of them at the end of the intended ridge, and the whole in one straight line. He then enters the plough at the first pole, keeping the line of poles exactly between the horses, and ploughs down all the poles successively; halting his horses at each, and replacing it at so many feet distant as the ridges are to be broad; so that when he reaches the end of the ridge, all his poles are again set up in a new line parallel to the first. He returns, however, along his former track, correcting any deviations, and throwing a shallow furrow on the opposite side of his former one. This mode has a decided preference over the common practice, of laying the two furrows *first* towards each other. By *first* throwing them from each other, and then reversing them, the whole ground is ploughed; and, if the first furrows are shallow, the ridge has but a slight elevation in the centre. These furrows, when reversed, form the crown of the ridge, and direct the ploughmen who are to follow. The same operations are carried on until the whole field is marked out.

The direction and length of ridges are points which must evidently be regulated by the nature of the surface, and the size of the field. Short angular ridges, called *butts,* which are often necessary in a field of irregular boundaries, are always attended with a considerable loss of time, and ought to be avoided as much as possible.

In ploughing steep land, it is advisable to give the ridges an inclination towards the right hand at the top, by which, in going up the acclivity, the furrow falls more readily from the plough, and with less fatigue to the horses. Another advantage in forming ridges in

a slanting direction on such land is, that the soil is not so likely to be washed down from the higher ground, as if the ridges were laid at right angles. Wherever circumstances will permit, however, the best direction is due north and south, by which the grain on both sides of the ridge enjoys nearly equal advantages from the influence of the sun.—*Enc. Britanica.*

In ploughing relatively to season, it is well known, that clayey or tenacious soils should never be ploughed when wet; and that it is almost equally improper to let them become too dry; especially if a crop is to be sown without a second ploughing. The state in which such lands should be ploughed is what is commonly indicated by the phrase "atween the wet and the dry,"—while the ground is slightly moist, mellow, and the least cohesive.—*Enc. Ag.*

Cattle Husbandry.

MIDDLE HORNS—DEVON COW.

"There are few things more remarkable about the Devonshire cattle than the comparative smallness of the cow. The bull is a great deal less than the ox, and the cow almost as much smaller than the bull. This, however, is of some advantage, and the breeders are aware of it; for although it may not be necessary to have a large bull, and especially as those of any extraordinary size are seldom handsome in all their points, but somehow or other present coarseness or deformity, it is almost impossible to procure large and serviceable oxen, except from a somewhat *roomy* cow. These cows, however, although small, possess that roundness and projection of two or three of the last ribs, which make them actually more *roomy* than a careless examination of them would indicate. The cow is particularly distinguished for her full round clear eye, the gold coloured circle round the eye, and the same colour prevailing on the inside skin of the ear. The countenance cheerful, the muzzle orange or yellow, but the rest of the face having nothing of black, or even white about it. The jaws free from thickness, and the throat free from dewlap. The points of the back and the hind quarters different from those of other breeds, having more of roundness and beauty, and being free from most of those angles by which good milkers are sometimes distinguished."

QUALITIES OF THE DEVONS.

"Their qualities may be referred to three points; their working, fattening and milking.

"Where the ground is not too heavy, the Devonshire oxen are unrivalled at the plough. They have a quickness of action which no other breed can equal, and which very few horses exceed. They have also a degree of docility and goodness of temper, and also stoutness and honesty of work, to which many teams of horses cannot pretend. Vancouver, in his survey of Devonshire, says, that it is a common day's work on fallow land, for four steers to plough two acres with a double furrow plough. Four good Devon steers will do as much work in a field, or on the road, as any three horses, and in as quick, and often quicker, time, although many farmers calculate two oxen as equal to one horse. The principal objection to the Devonshire oxen is, that they have not sufficient strength for tenacious clayey soil: they will, however, exert their strength to the utmost, and stand many a dead pull, which few horses could be induced or forced to attempt. They are uniformly worked in yokes, and not in collars. Four oxen, or six growing steers.

"There is a peculiarity in driving the ox-team, which is very pleasing to the stranger, and the remembrance of which, connected with his early days, the native does not soon lose. A man and a boy attend each team; the boy chants that which can scarcely be regarded as any distinct tune, but which is a very pleasing succession of sounds, resembling the counter-tenor in the service of the cathedral. He sings away with unrivalled lungs, as he trudges along almost from morning till night, while every now and then the ploughman as he directs the movements of the team, puts in his lower notes, but in perfect concord. When the traveller stops in one of the Devonshire valleys, and hears this simple music from the drivers of the ploughs on the slope of the hill on either side, he experiences a pleasure which this operation of husbandry would scarcely be supposed to be capable of affording. This chanting is said to animate the oxen somewhat in the same way as the musical bells that are so prevalent in the same country. Certainly the oxen move along with an agility that would scarcely be expected from cattle: and the train may be watched along time without one harsh word being heard, or the goad or whip applied. The opponents of ox-husbandry should visit the valleys of North or South Devon, to see what this animal is capable of performing, and how he performs it.

"The profit derived from the use of oxen in this district, arises from the activity to which they are trained, and which is unknown in any other part of the kingdom. During harvest time, and in catching weather, they are sometimes trotted along with the empty wagons, at the rate of six miles an hour, a degree of speed which no other ox but the Devon has been able to withstand.

"They are usually taken into the work at about two years, or twenty-six months old, and they are worked till they are four, or five or six; they are then grazed, or kept on hay, and in ten or twelve months, and without any further trouble, they are fit for the market. If the grass land is good, no corn, or cake, or turnips, are required for the first winter; but, of course, for a second winter these must be added. The grazier likes this breed best at five years old, and they will when usually taken from the plough, fetch as much money as at six. At eight or nine years, or older, they are rapidly declining in value.

"Lord Somerville states, that after having been worked lightly on the hills for two years, they are bought at four years old by the tillage farmer of the vales, and taken into hard work from four to six; and, what deserves consideration, an ox must thus be worked in order for him to attain his fullest size. If he his kept idle until he is five or six, he will invariably be stinted in his growth. At six he reaches his full stature, unless he is naturally disposed to be of more than ordinary size, and then he continues to grow for another half year.

"Their next quality is their disposition to fatten, and very few rival them here. They do not, indeed, attain the great weight of some breeds; but, in a given time, they acquire more flesh, and with less consumption of food, and their flesh is beautiful in its kind. It is of that mottled, marbled character, so pleasing to the eye, and to the taste. Some very satisfactory experiments have been made on this point.

"Mr. Carpenter a very intelligent farmer, informs us, that the Duke of Bedford had some prime Hereford oxen sent to his Tavistock estate in the month of April, and he ordered some Devons to be bought at the latter end of the same month. The Devons were not in so good condition as the Herefords when they were put to grass, and cost about £5 a head less than the Hereford; but at the latter end of December, when they were all sold to the butcher, the Devons were superior in fatness and weight.

"A more satisfactory experiment was made by the same nobleman. Six oxen were selected in Nov. 16, and fed until Dec. 10, the following year, and the following was the result:

	1st weight. cwt. qrs. lb.	2d weight. cwt. qrs. lbs	Gained. cwt qrs lbs	Oil cakes. stone. lbs.	Turnips lbs.	Hay lbs.
1 Hereford,	17 0 1	18 3 0	1 2 27	24 3	2700	487
2 do	18 1 0	21 0 25	2 3 25	41 5	2712	432
3 Devon,	14 1 7	17 2 7	3 1 0	45 4	433 2668	295
4 do	14 2 4	19 1 0	4 2 14	64 6	442 2056	442
5 Susses,	16 2 0	19 3 0	3 1 0	45 4	432 2655	392
6 Leicester,	15 2 14	18 2 0	2 3 14	40 2	434 2652	400

"An experiment of the same nature was made, in order to compare the fattening properties of the Glamorgan with the Devon.—They were fed from Jan. 6 to Dec. 1, and the following was the result:

	First weight. cwt. qrs. lbs.	Sec. weight. cwt. qrs. lbs.	Gained. cwt. qrs. lbs	or stone.
1 Devon, -	13 1 7	17 3 7	4 2 0	63
2 do - - -	16 0 10	20 3 14	4 3 2	67
3 Glamorgan, -	16 3 0	16 0 14	3 3 18	54 6

"We are aware that experiments have been instituted with different results.

"For the dairy, the North Devons must be acknowledged to be inferior to several other breeds. Their milk is good, and yields more than average proportion of cream and butter;* but it is defi-

*The difference in the richness of milk in oleaginous properties often amounts to one-third. The writer of this note tested the milk of five cows, about the same time, with the lacotmeter. The cream was found to vary from nine to fifteen per cent.

cient in quantity. There are those, however, and no mean judges, who deny this, and select the North Devons even for the dairy.

"Mr. Conyears, of Copt Hall, near Epping, a district almost exclusively devoted to the dairy, preferred the North Devons, on account of their large produce, whether in milk, butter, or by suckling. He thought that they held their milk longer than any other sort that he had tried; that they were liable to fewer disorders in their udders; and that being of small size, they did not eat more than half what larger cows consumed. He thus sums up his account of them: 'Upon average, ten cows gave me five dozen pounds of butter per week in the summer, and two dozen in the winter. A good North Devon cow fats two calves a year. My 30 North Devon cows have this year upon an average, produced a profit of £13 14 0 per cow.' [About $61.] As nurses they are excellent; and the calves thrive from their small quantity of milk more rapidly than could possibly be expected."

Miscellaneous.

CANADA THISTLES.

Although we gave an abstract of the following communication, which we copy from the Genesee Farmer, in our first number, yet from the high character of the gentleman who wrote it, THOMAS HILLHOUSE, Esq. as a citizen and a farmer, the importance of the subject, to our agriculture,—and a perfect conviction, arising as well from a conversation with Mr. Hillhouse, as from the laws which govern vegetation, that the mode here recommended, if strictly attended to and persevered in, is the most effectual mode of destroying this noxious cumbrance of the ground,—we are induced to copy it entire.

I have recently noticed in the Genesee Farmer several articles on the destruction of the Canada thistle; but none of them seem to reach the *root* of the evil. I am, however, pleased to see the public attention drawn to the subject.

The extermination of this pest of our plough fields, is an object of great importance to all farmers, who are unfortunate enough to have them on their lands; and it is therefore, in a measure, incumbent on them to communicate to each other whatever methods they have taken for that purpose, and particularly such as have had the desired effect.

I have no expectation that this thistle is to be totally and entirely eradicated, and banished from the country, as it is a perennial plant, and is to be found on the road sides, in woods, and in all unoccupied lands, (at least in this vicinity.) All that can be done with such, if near at hand, is to cut them off and prevent their seeding. But being possessed of another manner of propagating themselves, more sure and certain, by their side or horizontal roots, which the cutting of the tops of the plant does not affect or check; they therefore must be permitted to remain, in such places, by a sort of compromise, that they are to be prevented from scattering their seeds on to our plough fields, from which I am confident they may be expelled, and after which, easily kept out; any further than this I shall not attempt doing or advise others to do.

Some enactments of the legislature, as recommended in the Farmer, would undoubtedly be of use. Such as obliging the owners of land (at least such as is under improvement,) to cut them at the proper time—imposing a penalty for neglect—and making it the duty of overseers of highways to have this done on the margin of roads. It would likewise have the effect of calling the public attention to the thing, and spread the alarm.

In articles of this sort, intended to guide the operations of others, unless one goes somewhat into detail, the object is in a measure lost; for those (if any there should be,) who may be induced to adopt the method recommended, will have a wish to know all the particulars of the process before they commence. I shall therefore be compelled to make this of greater length than I supposed at first setting out would be necessary. What is here stated, however, is all from my own knowledge; nothing is given on hearsay.

When I purchased the farm which I now occupy, about thirty years ago, excepting some meadow lands, near a river, and some other small pieces, there were little or no improvements on it; being thrown out to commons, and mostly covered with small sapling wood and bushes—or as my Dutch neighbors expressed it, "*it had run out to bush.*" In open spots in this *bush*, the Canada thistle was sprinkled pretty liberally; and after clearing and ploughing they began to spread to an alarming extent, and threatened to overrun the whole premises. The first led me (but not in time by many years) to adopt some method more effectual than cutting off the tops to stop their progress.

It is well known to all farmers as well as botanists, that the roots of no tree or plant, whether annual, biennial or perennial, can long survive, if prevented from vegetating, and coming to the light of day. My theory was based on this principle. I commenced operations about eight years ago on some small patches in a field planted with corn, as soon as any thistles appeared after planting, cutting them off twice a week at first: and was very particular never to have it neglected. It would take but a few moments to go over a patch two or three rods square, with a hoe; at the same time being very careful to leave none: and to be sure of this I generally went over the ground, row by row, a second time. The deeper they are cut off with the corner of the hoe, the longer time of course it will require the new shoots to reach the surface again. I followed them up in this way, and about the middle of August they began to come up thin and scattering, and appeared of a sickly, yellowish hue.—This was encouraging, and we continued the operation, (though I found it was not necessary to look to them quite as often as at first,) to about the first of October, or until no more appeared, and none have since shown themselves in these spots.

By digging down to the main roots in August or September, they were found in a state of decay, being of a blackish colour. The result of this first attempt, is already given; but I will give something more of the details of the operation. That there should be no difficulty in finding the several patches when the corn had attained its full height, I placed high poles at each spot so that they could be seen over the tops of the corn, and kept a hoe on the ground to be ready at hand whenever I happened, in walking over my premises, to take them in my way, and cut them off if any were to be seen. In this way, but little time was spent; in fact none worth noticing. And as early as the first of October, as before observed, they were completely conquered. I ascribe the early season at which these patches were subdued, to their being allowed no breathing spell, and no omission being made through the season of operation, of cutting them off as fast as they appeared.

I have sometimes in lieu of, or rather for the want of a hoe, used a piece of hard wood, flattened to two or three inches wide at one end, and sharpened; or what is still better, a piece of iron or steel, like a chisel, fastened to the end of a stick or walking cane. It is proper to have some kind of tool in hand, or at the spot, otherwise some might escape, when one was accidentally passing near them.

Although the actual labor and time spent to destroy thistles in this way, is but trifling, at least in small patches: still it requires considerable patience and much diligence, that the thing may never on any account be neglected during the season of their growth; and I would caution all such as may have an inclination to try the experiment, that unless they are fully determined to persevere, and have full confidence that they can do it for at least four months, not to attempt it; because by any neglect during the season, the previous time spent, is in part lost; as by allowing the plants a breathing spell in the sun and air, now life and vigor is communicated to the roots, which is the thing intended to be destroyed.

As an evidence of this, in the season of 1828, I undertook to kill the thistles on a field of about fifteen acres planted with corn; and on which there were near twenty patches. Having placed the poles as before, I began cutting them as soon as any appeared after planting. They were followed up without any neglect, and as fast as they appeared, until about the 20th of August, when they appeared nearly subdued or in a fair way for it, beginning to come up scattering and yellow. At this time I was called away on a journey. and was absent nearly four weeks, leaving strict injunctions on my men not to neglect the thistles in my absence. How far they attended to it, I cannot say, for immediately on my return, I was taken sick, and was confined until after corn harvest. The thistles of course were forgotten. To make the matter still worse, the ground instead of being planted again as it should have been, was sown with barley and peas, and in September following with wheat, and the next spring stocked with clover for pasture. The same patches of thistles having revived, began to show themselves, on the barley and peas, but being few in number and scattering, no attention was paid them. They have since continued to increase and spread by their horizontal roots, so that there is nearly or quite as many on the field as at first; although they have been regularly mowed off every year, and sometimes a second time, and have not

seeded. This failure was evidently owing to the business not being attended to as it should have been the latter part of the season; but might have been remedied had the ground been planted with corn the second year, and which I shall do soon, and hope to avoid a like neglect, by which our labor in experimenting this season was lost.

The season of 1830, I planted another field with corn of about the same size of the last mentioned. There were on this field a number of patches of the thistle, some of them large, say over half an acre, some small. It was calculated that altogether they would have covered two and a half acres of ground. Having as usual marked the spots with poles stuck in the ground, we commenced cutting them at the proper time. The labor required on this field was more than on any I had yet taken in hand—the patches being large, and the thistles thick and strong. At first, and while vegetation was quick and rapid, the labor to go over them was equal to two men a day; but in a short time one man would do it in the same time, and towards the close of summer, in three or four hours. Some of these patches were very obstinate, so that we were obliged to follow them up into October; others gave up sooner. On the whole, they were totally destroyed. None escaped, and none are now to be found in any part of the field that has been ploughed.—Although we succeeded in destroying the thistle on this field the first year, I should advise, where killing them is the great object, to plant with corn two years in succession, (although this in other cases might be bad management,) that should any thistles escape the first, they may be finished the second year.

I cannot state the expense of this experiment, as I kept no memorandum; but should think it would amount to not more than twenty dollars, if men had been hired for that express work: but as it was done mostly by boys, with myself, or some careful hand to overlook, I paid out nothing extra for labor that season on account of this job, and there was no neglect of other farming operation. But twenty or even forty dollars, would be nothing compared with the object attained, by clearing a good plough field of this nuisance. Had they been left to their natural course, they would in a few years, by the running of their horizontal roots, and scattering with the plough and harrow, have spread over the whole field and ruined it for tillage.

The last season I planted with corn a small piece of about four and a half acres, much infested with thistles. It was planted with the express view of killing them—they were spread over a great part of the ground, but were small, the land having laid in pasture 12 years without ploughing, and had become what is termed sward-bound, which checks the growth, although it does not kill the thistle. The same course was pursued as in former years, and the business was well and regularly attended to. But few appeared after the first of September, but they were not neglected as long as one was to be found. I think they are all destroyed; but to make the thing doubly sure, I intend to have it planted next season.

A small piece at one end of this ground was planted with potatoes, on which I had never noticed any thistles. They however made their appearance, and were cut off with the rest. But when the tops of the potatoes began to fall on and cover the ground, it was with difficulty that the thistles could be found, and probably enough has escaped to keep the roots alive, and more or less will make their appearance another year. I therefore would advise never to plant potatoes where, and when, the great object is to destroy the thistle. On another account, I consider corn much the best crop to plant with this view. The roots of this plant, if it grows strong, run through and fill the ground with small fibres, which has a tendency to keep the ground dry and hard; at the same time the tops form a shade, and altogether seem to have the effect of checking the growth of the thistle, and aid in the operation of destroying it.

To prevent the necessity of going over the ground as often as was required with the hoe, I last spring had made some iron tools not unlike a small light crowbar, flattened at the lower end to about a hand's breadth and length, and steeled. With this tool, in soft mellow ground, the thistle may be taken up to the depth of six to twelve inches; but the process is much slower, and perhaps the time employed in killing them in this way, although the operation is not so often to be performed, is equal to doing it with a hoe, with which the ground is much quicker gone over.

The horizontal root of this plant, so often mentioned as its principal instrument of propagation, will be found at various depths, according to soil. In lands under the plough, and in other rich mellow ground, they push themselves along, in every direction from the main patch, and at every few inches send up a branch to the surface. On carefully uncovering a space several feet square, I have found them in a manner connected and tied together with this root. Whenever they can be taken up below the horizontal root, they are mostly destroyed with once going over, and with the iron tool before described this is frequently done; and where there may be a very small patch in a distant field, the inconvenience of looking to it as often as would be necessary with a hoe, might be avoided by taking this course. In wet rainy seasons, like the two last, I find they spread themselves much fasten than in dry ones. The ground being soft, and the roots strong and vigorous, and meeting less resistance, they will push along a considerable distance in one summer.

About nine years since, I had made a string of half stone fence, with posts, and boards on top. The ground on which the wall was placed, was rich bottom, and was set there to withstand the spring floods. It was made on the line of one of my neighbor's land, on which at a small distance was a large patch of Canada thistles. In a short time they pushed along and reached the wall, and have run along in, and under it, more than thirty rods, or fifteen each way, in about seven years. Having heard that salt and strong brine would kill them, I procured, three years ago, a quantity taken from fish barrels, and taking off the top stones of the wall so as to come nearer the roots, the brine and salt was put on very bountifully. It had the effect of killing the tops of the thistles, and wilted them down; but the next summer they came up through the wall as thrifty as before. I see no remedy in a case like this, but to remove the wall, otherwise they will travel to each end of it, and from this lodgment spread over the adjoining field. And I have no doubt, that if a strip of rich mellow land, reaching a distance of twenty miles, could be had, unobstructed by rivers, swamps, &c. a low stone wall placed thereon, and a family of thistles set a going at one end, but that they would in course of time reach the other, and without the agency of any seed.

On my mowing and pasture lands, such as are wet and never ploughed, there are some patches of the thistle, which have for twenty-five years past remained nearly stationary. They are always mowed off in July, before the seed is ripe, and if necessary, a second time, to prevent their seeding. In this kind of hard sward land, they are small and puny, and compartively give but small trouble and annoyance.

Whenever we have succeeded in expelling the thistle from our tillage lands, which is the extent of my expectations, in respect to my own, and all that I would at present advise to others to attempt doing, they may, I am confident, with little care and no expense, be easily kept off afterwards. The seeding thistle is very small, and as easily destroyed as a pigweed, should they happen to be observed. It requires several years for them to form any considerable patch—their greatest security is their not being noticed, until by their side or horizontal roots they have run out in a different directions. Small patches may be killed by a deep covering of anything that will keep them under, and prevent them from shooting up to the surface. This I have done with pummice put on to some very small bunches near my cider mill. Salting cattle and sheep often on small pieces will have the like effect; but this must be done very often and through the season of growing. The salt itself does not have the effect of destroying the roots, because it cannot reach them, but the frequent licking of the spot by the cattle takes off the shoots as fast as they come above the ground, which is the same in its effects, as hoeing them off. All these methods, however, cannot be practised except on a very small scale.

I know of no plant or bush, with which the Canada thistle so nearly compares in its habits and modes of propagation, as the common elder. This, like the thistles, has its seed, and its horizontal roots with which to form patches; and like it, also, in not being to be destroyed by cutting off the tops once, or even twice a year, but must be rooted out. The same treatment which kills the thistle would have the like effect on the elder: but this would be attended with too much trouble, for the same number usually on ours farms,—the better way, therefore, is to dig and root them out at once. But I think it is as great an absurdity for a farmer to say that he will not attempt to destroy the clumps of elder on his mowing land, because his neighbor lets them alone to seed, as to refuse to kill the thistle on his plough land for the like cause. Since in either case, when they are once eradicated they are easily kept out; let his neighbors' practice be what it may.

In my various experiments, I have tested this method of destroy-

ing the thistle sufficiently to convince myself at least that it is very practicable, and attended with but little expense, if pursued with due care and preseverance. If no failures had happened in my several and yearly attempts, another year would have completed the routine of my ploughing fields, but it will now take three—and as I am less than that, from three score and ten, and have a wish to complete what I have undertaken, I must be careful to avoid the like errors in future. I close this long article with the hope that it may be of use, by inducing some of my brother farmers, who have a good stock of resolution and perseverance, and a plenty of Canada thistles on their land, to try the experiment, at first, if they please, on a small scale. I shall be pleased to be informed of the results, and particularly of their success. In the interim, I would inform them that I have allotted and set off for the ensuing year, a pretty large job of the same sort. The ground on two fields being already once ploughed for corn, on which there are patches of thistles in plenty, enough to cover three and a half or four acres, of which, provided my health is spared, I hope to be able to give a good account at the close of another year.

A SUBSCRIBER.

NOTE.—I would add one more remark, that no grass or weeds of any kind, must be permitted to grow on the spots or patches during the season of the operation, as they conceal the thistle sprouts, which may consequently escape the hoe. I have usually, on spots where the thistles were thick and intermixed with weeds, hoed the ground well all over as often as was necessary to destroy the weeds, and at the same time the thistle was taken off also.

[*From the Farmer and Mechanic.*]

CULTURE OF SILK.

The committee appointed by the Hamilton County Agricultural Society, for the purpose of preparing some instructions in regard to the rearing of the white mulberry tree, and the silk-worm, having consulted the most approved works on the subject that could be obtained in Cincinnati, respectfully submit the following brief report upon this important department of the American System—

That the soil and climate of the United States are well adapted to the growth of the white mulberry tree (morus alba,) and the silk-worm, has been satisfactorily proved by the various experiments, which within the last fifty years, had been made upon that subject, in different parts of the Union. That the culture of silk in this country will be found highly profitable to those engaged in it is equally certain. Facts might easily be multiplied on this subject, but the following are deemed sufficient:

Four acres of ground planted in mulberry trees, near Boston, have afforded enough food, in one season, for the support of as many silk-worms as produced four hundred and twenty pounds of silk, worth three dollars and fifty cents per pound—amounting to fourteen hundred and seventy dollars. All the labor necessary in producing this result was performed by four girls, whose attention was required but for a small portion of the year.

Before the culture of silk was introduced into the less fertile parts of Languedoc, in France, the peasantry were miserably poor,—they are now among the richest in the kingdom. In some parts of France, a single mulberry tree has been known to yield a guinea annually to the owner from the sale of its leaves. When it is recollected that the cultivation of the mulberry tree is neither difficult or laborious, and that the collection of the leaves, the feeding of the worm, and the reeling of the cocoons, can all be advantageous performed by women, children, and decreped persons, it will certainly require no arguments to induce the farmers of the Miami country to turn their attention to the culture of silk. The results of this business are much more immediate than is generally supposed. By procuring, during the present season, a supply of eggs, and feeding the worms upon the leaves of the common black mulberry of our woods, which are found to be a pretty good substitute for the white, a return in profits may be had next year. If the seed of the white mulberry be sowed this season, the young trees will next year afford leaves for the worms.

There are three modes pursued in the cultivation of the white mulberry tree: The first is, to sow the seed broadcast, and, when wanted for food, to mow down the young trees annually, commencing on the second year. The second is to transplant them from the nursery, and suffer them to attain the size of trees. The third, and perhaps more preferable mode, is to sow the seed in drills, and allow the shrubs to attain to the height only of three or four feet, which may be done by cutting off the top limbs, the tender parts of which will answer as food for the worms. More mulberry foliage may be produced in this way, from the same quantity of ground, than can be obtained if it were occupied by full grown trees. The labor of gathering the leaves is also much less than is required after the trees have attained their full size.

From the experiments made in France, it has been ascertained that ground which has a sandy or gravelly soil, is best adapted to the growth of that kind of mulberry leaves which affords the finest quality of silk. The leaves of those mulberry trees which grow in a very rich soil are found to be too luxuriant and too full of juice for the production of the better kinds of cocoons.

The mulberry seeds may be sown at any time from the last week of April until the first week of June. The safer plan is to sow the seeds at different periods, say the last of April, the middle of May, and the first of June. When the ground is properly dressed and drills prepared, the seed is to be sowed after the manner of sowing lettuce seeds, and should be covered with fine light dirt.

Those of the young shrubs which it is wished should attain the size of trees must be transplanted from the drills the second year, and the most suitable time for this removal is immediately after the fall of the leaf in autumn. The side buds should be stripped off, leaving only such as are necessary in the formation of a suitable head for the tree. At the time of removal of the young trees, they should be cut off within seven or eight inches of the ground, and if they do not shoot well, the first year after they are transplanted, they should be cut in a similar manner the following season. The ground around the roots of both those in the drills and those transplanted, should be dressed several times a year, which will greatly assist their growth. It is advisable to plant out a few of the trees in sunny situations, that a supply of the leaves may be had for the worms of such eggs as may happen to hatch before the usual season.

The heads of such as are intended to attain the size of trees, should be hollowed out in a manner that will render it easy to collect the leaves, and such branches as may be broken in that process should be carefully removed. It may be proper to remark, that in France the cultivation of the mulberry tree for the sale of the leaves is a separate business from the rearing of the worms; and it is particularly recommended to the farmers of the Miami country to lose no time in filling some portion of their farms with this valuble tree, inasmuch as the day is not distant when the demand for its foliage will give them annually a handsome profit. It has been ascertained that the second crop of leaves which comes out after the first have been stripped off for the worms, furnishes a nutritious food for sheep, and is eaten by them with greediness. When intended for this object, the leaves should be stripped off a little before the time they would naturally fall, and laid by for use in the winter season. This experiment is worthy of a trial by our farmers, inasmuch as, after the first year, the mulberry tree required little or no attention, thus annually yielding a supply of food, without any cost save that of gathering it.

Silk—The raising of silk properly commences with the hatching of the worms. This will take place when the mulberry foliage is sufficiently matured for their consumption; or when the spring is advanced enough to make the temperature from 70 to 80 deg. of Fahrenheit. The first preparation to be made for them is that of a *dry, airy* room, or small building, in which stages of a convenient height and breadth for feeding them should be erected. Care should be used to exclude the enemies of the worms, viz: cats, poultry, rats, mice, and ants, from the room and stages in which the worms are placed. The former may be excluded by ordinary precautions, and the ants by keeping hot lime around the posts of the stages.—The eggs must not be brought out for hatching till the weather is settled; and if afterwards there should be a change to cold, a little fire may be kept in the room, to preserve the temperature at its proper height. The eggs when brought out, may be laid on the stages or tables, and no smoke, or effluvium of any description, permitted to enter the apartment, as the worms are very sensitive.

When the worms first appear they will be *black:* those which are *red* are bad, and should be thrown away, for they will produce no cocoons.

In *four days* most of the worms will be hatched, and those which come out after that time are generally too weak to produce silk.—The productions of each day should, when large quantities are raised, be kept separate, in order that they may form cocoons at the same time. When they are first hatched, they must be fed with

fresh and tender leaves of the mulberry; not more than half a dozen leaves to one thousand worms will *then* be required; but afterwards they will each devour a leaf. When the leaves become dry, or are eaten up, fresh ones must be given them, taking care not to put on so many as to smother the worms or obstruct their motions. For the first twenty days, they must be fed three times a day, and after that as often, day and night, as their food is destroyed or wilted.

The worms must be kept free from dampness, whether in their food or rooms; and they must not be too much crowded; a thousand full grown ones will be sufficient for a table three feet by twelve.

About the sixth, tenth, sixteenth, and twenty-second days, the worms will shed their skins and become sickly. At these periods they abstain from food, and should be fed scantily at first, and then not at all, till they recover. Sometimes they become afflicted with incurable diseases; in these cases they will be known by voiding a yellow liquor, and must be immediately separated, and, as well as the dead ones, thrown away. The disease is infectious, and therefore particular care should be used in preventing its progress.

Throughout the whole period of feeding them, their *litter* should be carefully taken away: at first, this need not be done often; but during the last stage of their growth it must be done as frequently as possible. Indeed, the utmost care should always be taken to keep them *clean*, and give them fresh food, and pure air.

When the worms are ready to spin, they will cease to wander about, becoming of the color of a new egg, nearly transparent, and will search for things upon which to fasten their cocoons. When a considerable number have this appearance, branches, twigs, and leaves, must be put up around the stages or table, upon which they will mount and spin their balls. This generally happens from the thirtieth to the thirty-sixth day. Various substances are used for the worms to spin upon, but Mr. G. B. Smith (from whose circular we have taken much valuable information) considers *chesnut leaves* the best. These, when dry, curl up, and thus form a place of deposite for the silk ball. Twigs must be broken off, with the leaves on them, and placed around the stage.

The worms, after beginning to spin, require no further attention till the cocoons are completed. The worms that begin to spin each day should be kept separate, and in eight days from the commencement of spinning the cocoons, they should be removed. Those from which eggs are expected, must be placed in a dry room, upon white paper, in rows about a foot apart. The worm will remain in its chrysalis state ten or twelve days, and then come out a grey miller. In a short time the females will commence laying upon the paper, each one laying about 450 eggs, which are at first of a sulphur color, but soon turn to a dark lilac; those which remain of a yellow hue are useless, and may be thrown away. The good ones must be kept in a dry, cool place, in a temperature of forty or fifty degrees.—In a high temperature, they might hatch.

The cocoons, from which silk is to be obtained, must be stripped of the *floss*, or loose outer coating, and the insect destroyed; otherwise it would soon pierce the ball and destroy the silk. The insect may be killed either by baking the balls for half an hour in an half heated oven, or, which is the better mode, by steaming them for a few minutes in a common kitchen steamer. After the cocoons are thus prepared, from thirty to fifty of them, in proportion to the size of the thread to be spun, may be placed in a kettle of water heated to such a degree that the hand may be barely kept in without scalding, at which temperature it must be constantly kept—Twigs are then to be stirred about in the vessel till a sufficient number of fibres is caught to make the thread you wish; and as the fibres break they are to be renewed, so as to keep the thread even. In this manner the silk may be reeled off with a common reel, and afterwards twisted in the manner required, by a common spinning wheel. After this, it should be boiled four or five hours in soap and water, and rinsed with clear water, to discumber it of the *gum*, which naturally adheres to it. The silk is now ready for use, and may be dyed any colour to suit the consumer.

In this report, the committee have not aimed to make an elaborate or novel treatise on the cultivation of the mulberry, or the rearing of the silk-worm; but merely to exhibit, in plain language, the more general and important directions in relation to those subjects, for the aid of the farmer and beginner, who may desire to embark, on a limited scale, in this, to our country, new and profitable branch of business. Other more minute rules will be easily learned by experience, and others of a more nice and more abstruse character, may be gathered from books written upon the subject in other countries.

B. DRAKE,
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Young Men's Department.

THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUIT OF SCIENCE.—*Continued from page* 35.)

With the help of his microscope he can enter into a world unknown to the ignorant, and altogether invisible to the unassisted eye. In every plant and flower which adorns the field, in every leaf of the forest, in the seeds, prickles, and down of all vegetables, he perceives beauties and harmonies, and exquisite contrivances, of which, without this instrument, he could have formed no conception. In every scale of a haddock he perceives a beautiful piece of net-work, admirably contrived and arranged, and in the scale of a sole a still more diversified structure, which no art could imitate, terminated with pointed spikes, and formed with admirable regularity. Where nothing but a speck of *mouldiness* appears to the naked eye, he beholds *a forest of mushrooms* with long stalks, and with leaves and blossoms distinctly visible. In the eyes of a common fly, where others can see only two small protuberances, he perceives several thousands of beautiful transparent globes, exquisitely rounded and polished, placed with the utmost regularity in rows, crossing each other like a kind of lattice-work, and forming the most admirable piece of mechanism which the eye can contemplate. The small dust that covers the wings of moths and butterflies, he perceives to consist of an infinite multitude of feathers of various forms, not much unlike the feathers of birds, and adorned with the most bright and vivid colours. In an animal so small that the naked eye can scarcely distinguish it as a visible point, he perceives a head, mouth, eyes, legs, joints, bristles, hair, and other animal parts and functions, as nicely formed and adjusted, and endowed with as much vivacity, agility, and intelligence, as the larger animals. In the tail of a small fish, or the foot of a frog, he can perceive the variegated branching of the veins and arteries, and the blood circulating through them with amazing velocity. In a drop of stagnant water he perceives thousands of living beings, of various shapes and sizes, beautifully formed, and swimming with wanton vivacity like fishes in the midst of the ocean. In short, by this instrument he perceives that the whole earth is full of animation, and that there is not a single tree, plant, or flower, and scarcely a drop of water, that is not teeming with life, and peopled with its peculiar inhabitants. He thus enters, as it were, into a new world, invisible to other eyes, where every object in the animal, vegetable, and mineral kingdoms presents a new and interesting aspect, and unfolds beauties, harmonies, contrasts, and exquisite contrivances, altogether inconceivable by the ignorant and unreflecting mind.

In the invisible atmosphere which surrounds him, where other minds discern nothing but an immense blank, he beholds an assemblage of wonders, and a striking scene of Divine Wisdom and Omnipotence. He views this invisible agent not only as a *material* but as a *compound* substance—compounded of two opposite principles, the one the source of flame and animal life, and the other destructive to both, and producing by their different combinations, the most diversified and beneficial effects. He perceives the atmosphere, as the agent under the Almighty, which produces the germination and growth of plants, and all the beauties of the vegetable creation—which preserves water in a liquid state—supports fire and flame, and produces animal heat, which sustains the clouds, and gives buoyancy to the feathered tribes—which is the cause of winds—the vehicle of smells—the medium of sounds—the source of all the pleasures we derive from the harmonies of music—the cause of that universal light and splendor which is diffused around us, and of the advantages we derive from the morning and evening twilight. In short, he contemplates it as the prime mover in a variety of machines—as impelling ships across the ocean, blowing our furnaces, grinding our corn, raising water from the deepest pits, extinguishing fires, setting power-looms in motion, propelling steam-boats along rivers and canals, raising balloons to the region of the clouds, and performing a thousand other beneficent agencies without which our globe would cease to be a habitual world. All which views and contemplations have an evident tendency to enlarge the capacity of the mind, to stimulate its faculties, and to produce rational enjoyment.

Again,—the man of knowledge, even when shrouded in darkness, and in solitude, where other minds could find no enjoyment, can entertain himself with the most sublime contemplations. He can trace the huge globe on which we stand flying through the depth of space, carrying along with it its vast population, at the rate of sixty thousand miles every hour, and, by the inclination of its axis, bringing about the alternate succession of summer and winter, spring and harvest. By the aid of his telescope he can transport himself to wards the moon, and survey the circular plains, the deep caverns, the conical hills, the lofty peaks, the shadows of the hills and vales, and the rugged and romantic mountain scenery which diversify the surface of this orb of night. By the help of the same instrument he can range through the planetary system, wing his way through the regions of space along with the swiftest orbs, and trace many of the physical aspects and revolutions which have a relation to distant worlds. He can transport himself to the planet Saturn, and behold a stupendous ring, 600,000 miles in circumference, revolving in majestic grandeur every ten hours around a globe nine hundred times larger than the earth, while seven moons, larger than ours, along with an innumerable host of stars, display their radiance, to adorn the firmament of that magnificent world. He can wing his flight to the still more distant regions of the universe, leaving the sun and all his planets behind him, till they appear like a scarcely discernable speck in creation, and contemplate thousands and millions of stars and starry systems, beyond the range of the unassisted eye, and wander among suns and worlds dispersed throughout the boundless dimensions of space. He can fill up, in his imagination, those blanks which astronomy has never directly explored, and conceive thousands of systems and ten thousands of worlds, beyond all that is visible by the optic tube, stretching out to infinity on every hand,—new creations incessantly starting into existence—peopled with intelligences of various orders, and all under the superintendence and government of the "King Eternal, Immortal, and Invisible," whose power is omnipotent, and the limits of his dominions past finding out.

It is evident that a mind capable of such excursions and contemplations as I have now supposed, must experience enjoyments infinitely superior to those of the individual whose soul is enveloped in intellectual darkness. If substantial happiness is chiefly seated in the mind, if it consists in the vigorous exercise of its faculties, if it depends on the multiplicity of objects which lie within the range of its contemplation, if it is augmented by the view of scenes of beauty and sublimity, and displays of infinite intelligence and power, if it is connected with tranquility of mind, which generally accompanies intellectual pursuits, and with the subjugation of the pleasures of sense to the dictates of reason—the enlightened mind must enjoy gratifications as far superior to those of the ignorant, as man is superior in station and capacity to the worms of the dust.

In order to illustrate this topic a little further, I shall select a few facts and deductions in relation to science which demonstrate the interesting nature and delightful tendency of scientific pursuits.

Every species of rational information has a tendency to produce pleasing emotions. There is a certain gratification in becoming acquainted with objects and operations of which we were formerly ignorant, and that, too, altogether independent of the practical tendency of such knowledge, of the advantages we may expect to reap from it, or the sensitive enjoyments with which it may be accompanied. A taste for knowledge, a capacity to acquire it, and a pleasure accompanying its acquisition, form a part of the constitution of every mind. The Creator has implanted in the human mind a principle of curiosity, and annexed a pleasure to its gratification to excite us to investigations of the wonders of creation he has presented before us, to lead us to just conceptions of his infinite perfections, and of the relation in which we stand to him as the subjects of his government. We all know with what a lively interest most persons peruse novels and romances, where hair-breadth escapes mysterious incidents, and tales of wonder are depicted with all the force and beauty of language. But the scenes detailed in such writings produce only a momentary enjoyment. Being retraced as only the fictions of a lively imagination, they pass away like a dream or a vision of night, leaving the understanding bewildered and destitute of any solid improvement. In order to improve the intellectual faculties while we gratify the principle of curiosity, it is only requisite that we direct the attention to *facts* instead of fictions; and when the *real scenes* of the universe are presented in an interesting aspect, they are calculated to produce emotions of wonder and delight even superior to those excited by the most highly-wrought tales of fiction and romance. The following facts and considerations will perhaps tend to corroborate this position.

In the first place, *the number of effects produced by a single principle in nature* is calculated to excite emotions of admiration and delight. From the simple principle of *gravitation*, for instance, proceed all the beauties and sublimities which arise from the meandering rills, the majestic rivers, and the roaring cataracts—it causes the mountains to rest on a solid basis, and confines the ocean to its appointed channels—retains the inhabitants of the earth to its surface, and prevents them from flying off in wild confusion through the voids of space—it produces the descent of the rains and dews, and the alternate flux and reflux of the tides—regulates the various movements of all animals—forms mechanical powers—gives impulsion to numerous machines—rolls the moon round the earth, and prevents her from flying off to the distant regions of space—extends its influence from the moon to the earth, from the earth to the moon, and from the sun to the remotest planets, preserving surrounding worlds in their proper courses, and connecting the solar system with other worlds and systems in the remote spaces of the universe. When a stick of sealing wax is rubbed with a piece of flannel, it attracts feathers or small bits of paper; when a long tube of glass, or a cat's back, is rubbed in the dark, it emits flashes of fire, accompanied with a snapping noise. Now, is it not delightful to a rational mind to know, that the same principle which causes wax or amber to attract light substances, and glass tubes or cylinders to emit sparks of fire, produces the lightnings of heaven and all the sublime phenomena which accompany a violent thunder-storm, and, in combination with other agents, produces also the fiery meteor which sweeps through the sky with its luminous train, and the beautiful coruscations of the aurora borealis? There are more than fifty thousand different species of plants in the vegetable kingdom, all differing from one another in their size, structure, flowers, leaves, fruits, mode of propagation, internal vessels, medicinal virtues, and the odors they exhale. Who would imagine that this immense assemblage of vegetable productions which adorns the surface of earth in every clime, with such a diversity of forms, fruits and colours, and the result of the combination of four or five simple substances variously modified by the hand of the Creator? Yet it is an undoubted fact ascertained from chymical analysis, that all vegetable substances, from the invisible mushroom which adheres to a spot of mouldiness, to the cedar of Lebanon and the banian-tree, which would cover with its shade an army of ten thousand men—are solely composed of the following natural principles—caloric, light, water, air, and carbon.

Again, is it not wonderful that the invisible atmosphere should compress our bodies every moment with a weight of more than 30,000 pounds without our feeling it, and the whole earth with a weight of 12,043,468,800,000,000,000 *pounds*, or five thousand billions of *tons;* that this pressure is essentially necessary to our existence, and that a small quantity of air within us, which would not weigh above a single ounce, by its strong elastic force counteracts the effects of this tremendous pressure upon our bodies, and prevents our being crushed to pieces—that the same cause prevents our habitations from falling upon us and crushing us to death, without which our glass windows would be shattered to atoms, and our most stately edifices tumbled into ruins!—that this atmosphere is at the same time performing an immense variety of operations in nature and in art—insinuating itself into the pores and sap-vessels of plants and flowers—producing respiration in all living beings, and supporting all the processes of life and vegetation throughout the animal and vegetable creation—that its pressure produces the process of what is called *suction* and *cupping*—causes snails and periwinkles to adhere to the rocks on which they are found—gives effect to the adhesion of bodies by means of mortar and cement—raises water in our forcing-pumps and fire-engines—supports the quicksilver in our barometers—prevents the water of our seas and rivers from boiling and evaporating into steam—and promotes the action of our steam-engines while raising water from deep pits, and while propelling vessels along seas and rivers?

In the next place, science contributes to the gratification of the human mind *by enabling us to trace, in many objects and operations, surprising resemblances, where we should least of all have expected them.* Who could at first sight, imagine that, the process of breathing is a species of combustion, or burning—that the diamond is nothing else than *carbon* in a chrystalized state, and differs only in a

very slight degree from a piece of charcoal—that water is a compound of two invisible airs, or gases, and that one of these ingredients is the principle of flame!—that the air which produces suffocation and death in coal mines and subterranean grottos, is the same substance which gives briskness to ale, beer, and soda water, and the acid flavor to many mineral springs—that the air we breathe is composed of the same ingredients, and nearly in the same proportions, as nitric acid or aquafortis, which can dissolve almost all the metals, and a single draught of which would instantly destroy the human frame—that the colour of *white* is a mixture or compound of all the other colours, *red*, *orange*, *yellow*, *green*,, *blue*, *indigo* and *violet*, and consequently, that the white light of the sun produces all that diversity of colouring which adorns the face of nature—that the same principle which causes our fires to burn, forms acids, produces the rust of metals, and promotes the growth of plants by night—that plants breathe and prespire as well as animals—that carbonic acid gas, or fixed air, is the product both of vegetation, of burning, of fermentation, and of breathing—that it remains indestructible by age, and in all its diversified combinations, still preserves its *identity*—that the air which burns in our street-lamps and illuminates our shops and manufactories, is the same which causes a balloon to rise above the clouds, and likewise extinguishes flame when it is immersed in a body of this gas—that the leaves of vegetables which rot upon the ground, and appear to be lost forever, are converted by the oxygen of the atmosphere into carbonic acid gas, and this *very same carbon* is, in process of time, absorbed by a new race of vegetables, which it clothes with a new foilage, and again renews the face of nature—and that the same principle which causes the sensation of *heat* is the cause of fluidity, expands bodies in every direction, enters into every operatiou in nature, flies from the sun at the rate of 195,000 miles in a second of time, and by its powerful influence, prevents the whole matter of the universe from being converted into a solid mass!

What, then, can be more delightful to a being furnished with such powers as man, than to trace the secret machinery by which the God of nature accomplishes his designs in the visible world, and displays his infinite power and intelligence—to enter into the hidden springs of nature's operations, to follow her through all her winding recesses, and to perceive from what simple principles and causes the most sublime and diversified phenomena are produced! It is with this view that the Almighty hath set before us his wondrous works, not to be overlooked, or beheld with a "brute unconscious gaze," but to be investigated, in order that they may be admired, and that in such investigations we may enjoy a sacred pleasure in contemplating the results of his wisdom and intelligence.—*Dick.*

Pleasure.—Neither is it enough to avoid sloth; you must likewise fly the excesses of that enchantress, pleasure. Pleasure, when it becomes our business, makes business a torment; and it is as impossible to pursue both, as to serve God and Mammon. You may perhaps think this lesson hard to learn; but it is nevertheless the reverse of the prophet's roll; and, if bitter in the mouth, is sweet in the belly.

To explain ourselves more fully on this head; do not imagine we mean by this, that though you must live by the sweat of your brow, you must not reap the harvest of your own labors. No man exacts it of you, nor would nature submit to the ungrateful dictate, if he did. We speak only of pernicious or unlawful pleasures, such as are commonly ranged under the word intemperance, such as prey on the body and purse, and in the end destroy both.—*Young Man's Own Book.*

Temperance.—But, that your integrity may be permanent, it must be founded on the rock of temperance. First, therefore, banish sloth, and an inordinate love of ease; active minds only being fit for employments, and none but the industrious either deserving, or having a possibility to thrive; which gave occasion to Soloman to exclaim, "The sluggard shall be clothed with rags; because he cries, Yet a little more sleep, a little more slumber!" But the folly of sleeping away one's days, is obvious to the dullest capacity, it being so much time abated from our lives, and either returning us into a like condition with what we were in before our births, or anticipating that which we may expect in the grave. In short, sleep is but a refreshment, not an employment; and while we give way to the pleasing legarthy, we sacrifice both the duties and employments of our being. —*Ib.*

Excess.—Excess is a deceitful evil, that smiles and seducess, enchants and destroys. Fly her very first appearance, then: it is not safe to be within the glance of her eye, or sound of her voice; and if you once become familiar with her, you are undone. Let us further add, that she wears a variety of shapes, and all pleasing; all accomodated to flatter our appetite and inflame our desires.

To the epicure she presents delicious banquets; to the bacchanal, store of exquisite wines; to the sensualist, his seraglio of mistresses; to each, the alurement he is most prone to; and to all, a pleasing poison, that not only impairs the body, but stupifies the mind and makes us bankrupts of our lives, as well as our credits and estates.—*Ib.*

THE CULTIVATOR—JUNE, 1834.

TO IMPROVE THE SOIL AND THE MIND.

SANDY LANDS NEAR ALBANY.

That so large a portion of the sandy land near Albany, the capital of the State, should be left waste and uncultivated, is to the stranger a matter of surprise, and to the citizen a cause of regret. In travelling west as far as Schenectady one way, or for a few miles on the western turnpike on the other, the eye is pained with the general appearance of waste and barrenness with which it is surrounded. The destruction of timber, which has left nothing but a few stinted pines, the continuous route of sand and sand-hills, the few enclosures one meets with, and the slovenly manner in which those enclosures have been made and the fields cultivated, show either that the soil does not admit of profitable cultivation, or that the owners of the land are too lazy or not competent to give it the opportunity. That the nature of the soil is entirely unsusceptible of cultivation, is contradicted by the fact that here and there industrious and enterprising men have made good farming investments, and are now beginning to realize a proportionate return. The example of these men show that even this land may be converted into good farms, and that industry and intelligence will ultimately accomplish it. Land so near to a good market, where its productions are so much called for, ought not to be permitted to lie waste. It is a reflection upon the whole community that thousands of acres are left in a state of worse than nature, because hitherto man has done little else than purloin and destroy the timber, its only production. I assume it as an established fact, that this land may be profitably cultivated. The success that has attended the few examples alluded to, is sufficient proof of it, and if even these examples in that location were wanting, similar soils have been most successfully cultivated elsewhere. So long have we been satisfied of this fact, that as early as 1815, we made application to the agent of the owner for the purchase of the fee simple of 1,000 acres of what, from general appearances at that time, we presumed was thought almost valueless. Obstacles, however, intervened, and a purchase was not consummated; but our opinion formed of the capacity of this soil at that time, has not changed by subsequent experience, and we hope the time will soon come that will bring all this land under the use of the plough; that time, however, cannot soon come, unless the fee simple of the soil is parted with. Men will not buy land that at present produces nothing, which is apparently useless to the owner, and will cost much to the occupant to improve for the ultimate benefit of others. They must have the encouraging thought, that what they expend upon it is for their own or their children's benefit, and the course of improvement consequently adopted, will be such as to give permanent value to their labors and wealth to society. The cultivation of these lands, from their nearness to, would be extremely beneficial to Albany. It would make a residence there more desirable—property more valuable—afford employment to its poor population, and ensure the most extensive as well as varied collection of vegetable productions. This is the kind of soil that wants intelligence and enterprise to cultivate it successfully. Your hum-drum farmer will not do here. He must be willing to expend as well as to receive if he expects to prosper, and the evidences of his success will soon be seen in the appearance of his fields. Upon a rich soil any one can farm successfully if he is only industrious—there nature has done all, and, like his ox, he has only to labor and live—but not so here, nature at present looks unpropitious, all the improvements of husbandry must be called to our aid, and in time stertility will be turned into fruitfulness, and what is now waste, into profitable culture. The bare and low sand-hills that oc-

casionally show themselves when the wood is removed, give a desert appearance to the land; they are not very numerous, but sufficiently so to repel an ordinary purchaser. Could these hills be brought under cultivation it would be a great desideratum—of these knolls, however, I do not despair. In the first place the wood upon them ought to have been suffered to remain; but where they have been already cleared, and clover and plaster applied in the ordinary way, and will not cover them with vegetation because the sand is too loose to permit the clover to remain long enough to take root, other means ought to be brought into use to effect the purpose. What the sand wants is adhesion, that the high winds do not shift it. The remedy for this loosness of texture is to create a vegetable mould, and to effect this, after sowing it with a spring crop, and a mixture of clover, timothy, with subsequently plaster, we would cover these knolls with straw raised in the valleys and saved for that purpose; they are not so numerous and large on a farm, but this may be easily done, for the intervening spaces between these hillocks of sand would now yield an abundance of it for that purpose. The straw once applied, and it is done without much expense or labor, would not only keep the sand from shifting, but would materially aid the succeeding crop; a sward once obtained, ought to be permitted to remain for some time, for the future cohesion of the soil would be much aided by the thousand decomposing fibrous roots of the grass. Where straw for a covering could not be obtained, I would suggest whether lime, incorporated with the soil by being put in with a crop, would not form a chemical combination with the sand, (as it does if you please, in mortar,) enough after the first rain to make it adhere sufficiently for the purpose of cultivation. Lime would likewise act as a valuable manure, and when applied with unfermented stable dung, aid very much to obtain the desired object. Again, wood ashes, by the alkali in them may be most usefully applied—on these sands they would, in our opinion, be invaluable—acting chemically on the sand and stimulating its vegetable productions, they would soon cover it with a growth that would prevent the wind from agitating its surface, if not make that surface more cohesive. Providence has, however, placed a remedy within the reach of every settler, and that is, as this has a substratum of clay, draw a little of this upon the bleak places, and by its intermingling with the sand, it will be sure to give the soil sufficient firmness to secure vegetation. To a practical and intelligent farmer located there, many remedies would suggest themselves to obviate the difficulty, and that once overcome, from the abundance of water running between these hillocks, and the fertility of the little and numerous valleys, this land to the grain farmer would be particularly desirable. This soil now will not bear frequent cropping. It appears to be this kind of farming on those places from which the stinted pines have been removed, that has so much injured it in the estimation of a prudent man, for every thing like vegetable remains has been abstracted from it, and left nothing but a bed of loose and drifting sand. Each grain crop ought to have been succeeded by a covering of grass until sufficient tilth was given to it to admit of successive grain, corn, or root crops. Were we to clear up a piece of this ground for cultivation, on the first, which would be a crop of wheat, (as we think it would bear it,) we would at once sow in the spring, clover, timothy and plaster. The few bushes and roots that might be left after a first ploughing, in places where the soil is very sandy, would be a sufficient protection against the influence of the winds. It should lie to grass one or two years, according to circumstances, then plough again, put in a spring crop and seed immediately again to grass, and so cultivate until there was a sufficient vegetable mould created to give cohesion to the soil, and leave nutriment enough in it to bring any crop to perfection. This soil, when brought into a proper state, is considered admirably adapted to turnips. The root culture will, in process of time, be a source of great profit, and come in as a necessary rotation, The county of Norfolk, in England, is said to contain 140,800 acres of light sand—formerly this was considered useless, but within the last fifty years it has been brought under the most successful and profitable husbandry, and is now one of the best, least expensive and most sought after tracts that an English farmer can settle on. If we adopt their management, making due allowance for the influence of climate, this land near Albany will soon be as valuable as theirs. A.

ON THE CULTURE OF CLOVER,

Few things have contributed more largely to the modern improvement of husbandry, than the introduction of clover, in connexion with the rotation of crops. This plant serves to ameliorate and fertilize the soil, and at the same time it affords an abundance of wholesome food for every description of farm stock. Whether cut for winter stores, for soiling in the yard, or fed off by stock, but few crops surpass it in the quantity of cattle food which it affords.—Although cultiuated in Holland and Flanders from an early period, with great advantage, it was not introduced into Great Britain till the 16th century. At present, clovers enter largely into the succession of crops there, on all soils, and in every productive course of management. They were principally instrumental in giving to Flanders its high celebrity, as an agricultural country, greatly in advance, in improvement, of the states around it. The clover system has converted some of the poorest districts in England into the most productive and profitable. In the United States it is comparatively of recent introduction; and even at this day its benefits are but partially appreciated or applied as they ought to be. In connection with gypsum, clover first became a subject of notice and culture in the counties about Philadelphia, and in the county of Dutchess, some forty years ago; and we are much indebted to the example and writings of Chancellor Livingston, Judge Peters, and other gentlemen of learning, wealth and enterprize, for the improvement and wealth which it has conferred on our land. Many of our farmers have yet much to learn, before they can realize the full benefits which it is capable of affording in the profits of the farm. Although botanists enumerate nearly fifty species of the clover family, our present remarks are intended to apply merely to the common red kind (*trifolium pratense.*)

There are three faults in the management of clover which we design briefly to notice, in reference to alternate husbandry. These are,

1. *Too little seed is usually sown.* The object of the clover crop is to procure a cheap food for animals and plants. Few if any crops surpass it in the quantity which it affords of these,—and few exhaust the fertility of the soil less. One farmer sows four or six pounds of seed to the acre, and gets in return a thin but coarse crop of hay or pasture. Another sows ten to fourteen pounds, obtains double the burthen of the first, and at a trifling extra expense of less than a dollar to the acre for seed, while his land is doubly benefitted by the green crop to be ploughed in. From ten to fourteen pounds of seed shuold be sown to the acre, whether the object be to benefit the stock or the land. The product will be somewhat in the ratio of the seed sown; and the advantages of heavy stocking, both in the hay and to the soil, will far out balance the cost of the extra seed.

2. *Clover lays are permitted to remain too long before they are brought under the plough.* The common clover is a biennial, or at most a triennial plant; and if not ploughed under before the third year, its advantages to the soil, as a green crop, are mostly or wholly lost; while after the second year, it adds very little to the crop of hay. But if turned under the first or second year, it furnishes to the soil a great quantity of vegetable matter, the true food of plants. It not only serves as manure, but it benefits mechanically. Its tap roots penetrate and divide the soil, and, as they decay, render it friable, and permeable to heat, air, and moisture. A well set clover lay imparts to the soil as much benefit, in our opinion, as ten loads of yard manure to the acre. When a broadcast crop is to be followed by a tillage crop, as corn, potatoes, or small grain, there is manifestly a decided advantage in stocking it with clover, though it is to be turned under the ensuing fall or spring. We estimate its value, as manure, to say nothing of the pasture it affords, at from five to ten dollars per acre, while the cost of the seed does not ordinarily exceed one dollar. I have rye and clover, upon a piece of poor sandy land, for which I had no manure to spare, three years in succession, with manifest advantage.

3. *The common method of curing clover hay is bad.*—The object to be obtained is, to cure the hay in the *cheapest* and *best* manner.—The common practice of spreading clover from the swath, causes the leaves and blossoms to dry and crumble, ere the haulm or stocks are sufficiently cured. Thus either the finer parts of the hay are lost, or the crop is housed with so much moisture, as to cause it to heat, and often to spoil. Clover should only be spread when it has become wet in the swath, and should be gathered again before the leaves dry and crumble. Both these evils may be avoided, and labor saved withal, by curing the grass wholly in swath and cock.—After experiencing the serious disadvantages of the old method, I adopted the one I am about to recommend, and have pursued it satisfactory ten or a dozen years. My practice has been, to leave the

clover to wilt in the swath, and when partially dried, either to turn the swaths, or to make grass cocks the same day, so as to secure the dried portions from the dew. That which is not put into cocks the first day, is thus secured the second day, or as soon as it has become partially dried. These grass cocks are permitted to stand one, two or three days according as the weather is, and as the curing process has progressed, when they are opened at nine or ten o'clock on a fair dry, the hay turned over between eleven and three, and soon after turning gathered again for the cart. Thus cured the hay is perfectly bright and sweet, and hardly a blossom or leaf wasted. Some care is required in making the cocks. The grass is collected with forks and placed on dry ground, between the swaths, in as small a compass as convenient at the base, say two or three feet in diameter, and rising in a cone to the heighth of four or five feet.

The advantage of this mode of curing clover are.

1. The labor of spreading from the swath is saved.

2. The labor of the hand rake is abridged, or may be wholly dispensed with, if the horse rake is used to glean the field when the hay is taken off—the forks sufficing to collect it tolerably clean in the cocking process.

3. It prevents, in a great measure, injury from dew and rain—for these cocks, if rightly constructed, (not by rolling) will sustain a rain of some days—that is, they have done this with me,—without heating or becoming more than superficially wet.

4. Clover hay made in this way may almost invariably be housed in good condition; and if rain falls after the grass is mown, the quality of the hay is infinitely superior to what it would be under the old process of curing.

The *rationale* is this: The outside of the clover parts with much of its moisture while in swath; and what is called sweating, in cock, is merely the passage of moisture remaining in the succulent stocks, to their exterior, and to their leaves and blossoms—it is a diffusion—an equalization of the remaining moisture in the cock.—When this has taken place, evaporation is greatly facilitated, and the whole mass acquires a uniform dryness, on opening the cocks to the influence of the sun and winds, if too long an exposure is guarded against. Evaporation progresses in the cocks, after the hay is gathered for the cart, and during the operation of loading and unloading. B.

RUTA BAGA—OR SWEDISH TURNIP.

The turnip culture is beginning to arrest the attention of our husbandmen, and it will acquire new interest as its advantages come to be better appreciated, and its practice better understood. Its introduction into Britain forms one of the most important eras in the improvement of British husbandry; and its introduction into our country will ultimately prove highly beneficial. Of the various species of the turnip, the ruta baga is decidedly superior for the nutritious properties which it possesses, and for its hardy late keeping qualities. Having had some years experience in its culture, we submit the following considerations as the result of our practice.

The *soil* best adapted to the Swedish turnip is one of loose texture and dry, inclining to sand, gravel or loam. It should be rich, well pulverized and clean. A clover ley, covered with yard manure previous to its being ploughed under, is to be preferred.

The *preparation* for the crop consists in one perfect ploughing, if a ley, a faithful harrowing, and the roller may be applied between the ploughing and harrowing, with benefit.

The *season* for *sowing* is from the 25th June to the 5th July. A cutting of early clover may be first taken off the ground.

The best *method of sowing* is with the drill barrow, an implement which costs ten to twelve dollars, and which comes in use for other purposes, in drills two and a half feet apart. With this a man will put in four or five acres a day. The crop may also be sown broadcast, or drilled in with a line and hoe, though the operation is more tedious, and when sown broadcast, the expense of cleaning and thinning materially increased.

The *quantity of seed* requisite for the acre is one pound—cost six to eight shillings—though if well drilled, half this quantity will suffice.

The *after culture* consists in thinning the plants and keeping the crop free from weeds. The plants should be thinned to eight or ten inches, as soon as they show their second or third pair of leaves, and it is important to have the first weeding performed early, as this not only benefits the crop, but saves subsequent labor.

The *implements* best adapted to the turnip culture are the cultivator, or horse hoe, and turnip hand hoe. The first is passed between the drills as soon as the plants show their second pair of leaves, and may be repeated at intervals with little expense and manifest advantage. It destroys the weeds, if applied in time, except on a strip of two or three inches where the plants grow, pulverizes the surface, and renders the soil permeable to atmospheric and solar influence. The operation of cleaning is finished with the hand hoe, the cutting part of which may be likened to the blade of a thin case knife, the two extremities of which are drawn out, turned up, united, and form the shank to attach the hoe to the handle. The advantages of this hoe are, that it does not gather the dirt and weeds, and may be drawn along the drills as far as the arms extend without being raised, and across the drill, between the plants to be retained, and almost wholly supersedes hand weeding. Two cleanings with the hoe generally suffice.

Gathering the crop is performed with the greatest economy of labor, by drawing the turnips by hand, and laying them separately across the drills, the roots of two adjoining rows towards each other, and then with a heavy knife, bill-hook, or like implement, strike off the tops with a blow as they lay, which is managed with great expedition. The roots are first gathered, and taken to the pit or cellar, and the tops, which are abundant, are then raked into small heaps, and taken to the yard for the farm stock as they are wanted.

To secure for winter, pits are made in the field, upon dry ground, two and a half feet broad, and as long as may be convenient, and of two to four feet in depth. These are filled, and the roots piled above the surface, in a roof-like form, till they terminate in a ridge. A slight covering of straw is then given, and the whole covered with earth, two feet or more in depth. A salutary precaution is then to make holes, with a bar, at intervals of three or four feet, upon the ridge, through the covering, that the rarified air which will be generated may escape. This may be partially closed with a wisp of straw. Another precaution is to cover the mound with a coat of yard manure early in December, the better to exclude the frost.

The product, under good mangement and on a suitable soil, is seldom less than six hundred bushels per acre, and often much more, of roots, besides a heavy burthen of tops, of which neat cattle are very fond.

Use.—This turnip is far more nutritious than the common turnip, keeps much longer, and is greedily devoured, cooked or raw, by horses, cows, sheep and hogs; and is withal a very excellent vegetable for the table, particularly from January to June. We are still feeding to cows and oxen (May 23) of the crop of last year. Our cows have ate them daily for nine weeks, and yet the turnip taste has not been perceptible either in their milk or butter—*the cows having daily access to salt.* To the sheep husbandman this root will be found peculiary serviceable, if fed to his flock in winter and spring, particularly ewes with lamb.

Of all root crops, if we except the common turnip, this is the least exhausting, occupies the ground the shortest time, is cultivated with the least expense, is saved with the least care, and we think makes the greatest return in food for animals.

THRASHING MACHINES.

Within a few years these instruments have come into use in this section of the country, and they have in a great measure superseded the old mode of thrashing by the flail or with horses. They have their advantages and disadvantages, but are upon the whole, useful instruments. I have seen tried a variety of different kinds, but the farmers here have settled down to the use of two kinds—one invented here, and called "the Vosburgh machine," for which a patent has never been obtained, but is nevertheless a good machine—and the other is "Allen's patent thrashing machine." Vosburgh's is a cylinder, working horizontally over a concave, and in both are teeth; the horse power is fixed and permanent. Allen's is likewise a cylinder and concave, and both are likewise armed with teeth.—The teeth are so set that in the turning of the cylinder, they pass between those in the concave, and the straw, with the grain in, is shoved in between them and carried through by the motion of the cylinder; the grain is thus separated from the straw. The cylinder is much smaller than Vosburgh's—the horse power is differently constructed, and portable, so that the machine, when in use, is only slightly fastened to the barn floor. It may, together with the horse power, be carried from barn to barn. The cost of a machine, requiring the power of two horses to use it, is from $70 to $80,

finished and complete for thrashing. For those requiring one horse power, the price is less, and for those requiring the strength of three horses, the pricee is proportionately increased.

Both of the machines above spoken of do their business well and with despatch, but the preference is generally given to Allen's. It is certainly an excellent instrument, and is extensively used. It thrashes quick and clean, and I think promises to be durable. I found that my men would thrash out 100 sheaves with it in from 10 to 15 minutes, and remove the straw; but the machine was stopped when the 100 sheaves were thrashed, to clean up the floor and to throw more from the mow. This last operation took up as much time as the thrashing. With a sufficiency of hands and a relief of horses, I think from 1,500 to 2,000 sheaves of wheat or oats might be thrashed during a day, and not hurry much—but in any event, hurry or not, the grain would be thrashed clean: if there was loss it would be in the carelessness of the men, in not raking out the straw carefully. If the machine is not too much hurried, the work is not hard for two horses, as mine seldom sweat; but they were always rested at the end of thrashing 100 sheaves. There can be no complaint that the machine does not work fast enough. The greatest labor is to remove and house the straw. To thrash off your grain as quick as you are enabled to, is one of the disadvantages of a machine; the straw is, in a measure, wasted, scattered and lost, and the farmer finds that he is minus at the end of the year several loads of manure. By slow thrashing this is avoided; then it is gradually thrown into the barn yard, becomes soaked with offals, and trod under foot by the cattle—the consequence is a good rich bed of manure at the end of the year. It is not so when the crop is thrashed off at once in the fall. The large quantity of straw collected in heaps around the barn is too often suffered to remain as it is thrown out, and becomes rotten straw, but not good manure. If some better plan of managing the straw to convert it into manure is not adopted, the introduction of thrashing machines will ultimately be an injury.

Another disadvantage inthe use of the thrashing machine is, that cattle do not eat the straw as readily as when the grain is thrashed out by the tread of horses; the machine beats off the blade and leaves the straw hard and stiff, and it is only when they can get nothing else that they will touch it. The farmer can obviate the difficulty of wasting his straw from thrashing his grain at once, by mowing it or scattering it carefully in his yard, and perhaps he can the second, by sprinkling it with salt, so that the cattle would eat it readily. These two objections overcome, and the thrashing machine is all that we could reasonably desire it. There is a great advantage in being enabled to get your grain to market in a short time; you can commonly obtain the highest price for it; and this to a farmer is an important consideration. For the last six years I have taken as accurate a note of this loss as possible, as in that time I have sometimes had a machine and sometimes not. My estimate would be 75 cents an acre for the size of my farm: at least it has operated so with me, and the loss has been, that when I have thrashed my grain in the ordinary way, the process was so slow that it was never ready for sale at the proper time, and sometimes, which is always bad policy, had to be kept over. The saving of time, to a farmer, is a great consideration, and is one of the great benefits he derives from the use of this instrument. When the spring comes he is then ready for the labor of the season; his old crop is entirely out of the way, and he can devote his whole time towards the attainment of another; besides, during the winter, from the time gained by the use of the thrashing machines, he has collected all the materials for his fencing and fire wood, done off all his chores, and his necessary visiting, so that during the summer season he can with ease keep ahead of his work, and have every thing done in due season—the gain in this way is at least equal to the gain in the increased price of the grain sold, so that he is twice paid for the cost of his thrashing machine. Such a man requires hire less during the season, and makes a saving that way, while at the same time he keeps his farm in the best possible order. The life of the farmer is at best a busy one, but when he gets behind his work, it is very slavish and unpleasant. So much for the advantages and disadvantages of the thrashing machine; but we will sum up and say it is upon the whole a decided improvement. A.

PASTURES.

It is now a well settled opinion, among good farmers, that lands, generally, cannot be profitably improved, for a course of years, either for meadow or tillage crops alone; but that the product and profits in both cases are materially increased, by changing from one to the other alternately. Constant tillage exhausts more than the manure of the farm can restore; while in the meadows the burthen of the hay annually diminishes, the soil becomes compact and hard, the benign influence of heat and air are partially excluded from it, the finer grasses run out, and their place is naturally usurped by moss and a stinted herbage. Besides, alternation seems to be among the primary laws of nature. We all know the importance of alternating our tillage crops; that a field will not carry the same grain, or kind of roots, two or more years in succession, without great expense in manuring, or constant diminution in product; and that meadows, after two or three years from being laid down manifestly decrease in their product.

The same law that renders alternation of grain and grass essential, applies with equal force to our pastures, although the opinion has prevailed, and with most persons is still popular, that old pastures are the best. To satisfy any farmer of the error of this opinion, let him appropriate an acre of old, and an acre of new pasture, recently laid down, to hay. If the land is of similar quality, he will find, that the new will give him two, three, and probably four times as much hay as the old. The same difference that we find in the hay, must exist in the pasture. The disparity appears not only in the quantity but in the quality and duration. From the soil being more permeable to heat and air, the active agents of vegetable decomposition and nutrition, the grass starts earlier in the spring, when in most demand, and continues to grow longer in autumn, in the new than in the old pasture. The plough and the harrow, and a change of crops, are as necessary to renovate pasture as they are to renovate meadow grounds. In noticing the modern system of Scotch farming in a recent work, we observed that on a farm of 500 acres, there was not an acre of grass, in pasture or meadow, which had been laid down more than two years.

As pertinent to the subject, we make the following extracts from a communication of Mr. Main, in the March No. of the Edinburgh Quarterly Journal of Agriculture. B.

"Struck, when a boy, with delight at the evergreen meadows of Doncaster, and the freshness, in the dead of winter, of the fields near London, I could not, in settling in the north, help contrasting these—with a feeling almost bordering on disgust—with our whity-brown *grass parks* of Scotland, wearing, in many places, a pale blue tint till the beginning of June, or puffed off in the newspapers, as affording "a full bite" in the middle of May. I said to myself, "cannot industry and exertion produce a change in our grass lands? Perhaps we cannot expect to vie with Doncaster or London, but still something may be done.' So doffing the gay soldier's coat, and putting on the hodded grey, I set to work, to try if fine pasture could not be got in Scotland. Long did I toil at top-dressing,—all the never-failing, oft recommended recipes of this compound and that compound, I tried in vain,—peat-earth in all the varied shapes of mixture with lime and dung, soot, composts with scrapings of ditches or other matter—all these I tried in various ways. I exhausted the pharmacopeia of agricultural quacks; and soon found out, that without the aid of plough and harrow, nothing could be done—in other words, that the ground must be put in *good heart* before you can have *good grass*.

"Well, that being done, I had fine grass; but it grew bad again; it was not fine *permanent pasture*. I had recourse, once more, to the old system of top-dressing, and of course improved the pasture, but again it fell off. By this time I had before my eyes the palpable fact, that new laid down grass was good, and that, do what I would, old grass could not be made to bring the same rent."

"It appears to me, that only on certain soils and situations, that pasture can be allowed to remain without great loss; that such situations are flat meadows, or the neighborhood of rivers or streams, rich in alluvial soil, and the natural habitat of the pasture plants, or in the vicinity of large towns, where manure has been applied till the ground could not bring a grain crop to maturity; and that on all other situations, recourse must be had to the plough, as soon as a failure in the grass crop takes place; and the breaking up will entirely depend on the quality of the land and manner in which it has been treated, there being no such true *unerring* guide to the *quality* of the land, as the length of time it can be profitably left in pasture."

"Little need be said on the unprofitableness of old pasture to the actual farmer. There is little old grass to be found on the farm of a man who has rent to pay. Have you never remarked the diffe-

rence of rent that is given by a grazier or butcher, for a field of new and a field of old grass? Have you ever put the question to yourself, Why is this? I shall give you the answer: Let both fields be shut up and cut for hay, weigh the produce, see the great difference in favor of the new grass, and the secret is out. Still keep the cattle from the field; look at the new grass, how soon the aftermath springs! Well, then, is not the overplus of the hay that which would have fed so many more cattle? and yet people prate about old grass."

"Not only is the produce of an acre of new grass far greater than that of an acre of old, but it is more palatable to the cattle, and, as far as I have been able to observe, exactly in the ratio of the age of the grass. An example of this came lately under my eye: A tradesman occupied a field which he cultivated regularly—breaking up a bit, green cropping it the following year, and then sowing it down, after which he pastured it by wethering his beasts. The man having the place, I caused some hurdles (fence) to be put around the bit not in grass, and left the rest of the field in pasture. The cattle, during the whole of summer, ate the new grass to the very earth, and did not taste the older, until the force of hunger made them do so. Next season, the bit which had been hurdled off was sown out, and was allowed to go with the rest of the field. The very same thing took place—the new grass was first eaten, and then that which was older. I had an opportunity of observing last summer the marked preference which sheep give to young grass, compared with old, by putting cattle into two fields, separated by a fence only,—one very fine grass of some years standing, the other only three years old, and, pulling out some of the lower rails of a communicating gate, permitted forty sheep to pass through, and pasture in whichever field they pleased. The result was, they were constantly to be found in the field of younger grass, and very seldom went into the old grass enclosure. At last I was forced to shut them into the old grass, finding they were reducing the feed in the one, and leaving too much in the other. Be it always remembered that land must be well laid down. If grass, however new, be growing on poor land, or wet, or on land that has been badly cleared, cattle do not relish it. I have seen frequent instances of this. More particularly do they dislike pasturing on foul land."

"Having now broached the subject, I would not for the present at least, pursue it any further; but ere I take my leave, I would in the first place, state in corroboration of what I have been endeavoring to maintain, that by following the breaking up system instead of the top-dressing one, I have not only altered the verdure, but I have increased the rent of the old grass lawn on my farm from three to five fold. In conclusion, I would make a brief recapitulation of my sentiments: I maintain that except a few favored spots, as banks of rivers, &c. no ground can, without loss, be left long in pasture: that it appears to me four or five years is, generally speaking, the longest period land should be allowed to lie in grass; that if pasture be the object, at the end of that time, the ground should be broken up and returned to grass again. I maintain that *without grass* severely cropped land cannot be restored to full fertility; and *without cropping*, grass cannot be made to continue at the maximum point of utility and verdure."

Information wanted.—The inquiry is often made, where fine animals, new and improved farm implements, and rare and choice agricultural seeds, can be procured, and at what prices respectively. The Publishing Committee are desirous of collecting informations upon these subjects, with a view of publishing it, in a condensed form, in their September number of the Cultivator, in time to have it disseminated preparatory to the October fairs. And as the State Agricultural Society have appointed a State Cattle Fair to be held at Albany on the first Wednesday and Thursday of October next, they are also desirous of notifying buyers, before hand, through the Cultivator, of the choice animals, implements, and seeds, which will be offered for sale at said fair, and as far as practicable, the names of owners, and the prices which will be demanded. They invite information upon both these subjects any time before the 20th August; and as the information will be gratuitously published, it is hoped our correspondents will not subject us to the charge of postage.

Editors of newspapers will aid us in our object, and we think render an acceptable service to their customers, by inserting the preceding notice in their journals.

Old Apples.—Mr. Lewis Tucker, of Cummingham, Mass. has sent us three Roxbury russets, which have been kept through two winters and one summer,—*in dry sand*. The fruit was sound, and but little shrivelled, and had the freshness and flavor of last year's crop. Might not this mode of preserving winter apples and pears be adopted on a large scale with profit? It certainly might if they commanded the price here they do in the London market. The Gardener's Magazine for April quotes Newton pippins at 10, to 12s. ($2.22 to $2.86) per bushel—Nonpareils at 1l. to 2l. 10s. ($4.44 to $11.10.) per bushel, and pears at 4 to 6s. per dozen.

Young Farmers Associations.—We have received a letter from a young man in Decatur, who states that he is yet in his teens, soliciting our advice as to the formation of *a Young Farmers Society*, for mutual and self-instruction, which he and the neighboring youth are anxious to establish. The object is praiseworthy, and the zeal of our young correspondent is so highly commendable, that we consider it a duty and a pleasure to comply with his request.

The plan we would recommend is this: that the objects of the society be limited, for the present, to the procurement of an agricultural library, and to the discussion, at stated terms, during the winter months, of subjects of common interest, relating to the business of husbandry, or the relative and social duties of life. We will suppose that a district or neighborhood contains twenty young men who would be willing to associate—and we would fain believe this number, between the ages of fourteen and twenty-four years, would be found almost any where—and who would agree to contribute six cents a week to this object; their joint contributions would amount in a year to sixty-five dollars. The same contribution from ten, or of three cents a week from twenty, would give $32.50 per annum; and even this latter sum would suffice to purchase all the agricultural periodicals of our country, and to buy annually some of the standard works on husbandry. The three or six cents weekly, might, be *earned* by an hour or so of extra labor, or *saved* by curtailing some needless expense. The maple yields its sap only by drops, and yet its daily droppings soon amount to pails-full, and produce the sugar for our tables. The prudent employment of time and money is no less surprising and certain in its results and its benefits. These periodicals and books might be read in succession by every member of the association, and thus each individual would reap the full benefit of the contributions of the twenty; or in other words, by paying three dollars and a quarter a year, he might enjoy the perusal of sixty-five dollars worth of books and agricultural papers;—and from these he might learn the practices and management of the best farmers in every department of husbandry, and acquire by degrees, more or less knowledge of the principles, or science, upon which good farming is based. The hours of ordinary relaxation from labor would afford ample time for acquiring this knowledge, during the years of youth and incipient manhood; and every day's labor would serve to illustrate, and render it subservient to profit and pleasure. These hours of relaxation, applied to useful study, have often done more to inspire a laudable ambition, to improve the intellect, and to elevate humble worth, than an uninterupted habit of study. And our young friends may rely upon the fact, that this reading, accompanied by the good habits which it tends to beget and confirm, will as surely lead to pleasure and profit—to respectability and distinction—as the seed deposited in a well prepared soil will yield its accustomed increase. He that would gather a harvest in manhood, *must* sow the seed in youth.

Young men greatly err who suppose, and the error is but too common, that either a good reputation, or talent, or, I might venture to add, fortune, are hereditary, and descend from father to son as matters of course. Every young man has in a measure to fix the standard of these for himself. Parents may educate, may inculcate good habits, and may confer wealth—but after all, these are but the foundation—the superstructure of character,—be it for usefulness or sloth,—for virture or vice,—must be reared and receive its finish from the son himself. The richer the soil, the greater vigilance is required to keep it from weeds. What happens to the soil will happen to the mind: without culture it also will run to weeds.

Our young readers are doubtless familiar with the names of Franklin, Fulton and Rittenhouse, and know the pride with which their names are ever pronounced by Americans.—These, as regards fame and fortune, were self-made men. They all spent their youth in habitual labor, without wealth or influence, and with but the ordinary advantages of education; yet they found ample time to enrich their minds by study. They had no better prospects ahead than hundreds, and we hope thousands, of farmers' boys, who may read

these remarks, save what was afforded them by a fixed resolve, to win and wear a good and great name. By study, industry and perseverance, they achieved their object; and they have left examples worthy the aspirations of our youth, however humble be their condition in life.

We are highly pleased with the suggestion which has drawn forth these remarks. We hope the plan may be matured and go into successful operation, and that other towns may be induced to adopt the example. Associations of this kind are not only calculated to make two blades of grass grow where but one grows now, but to raise the standard of our character for intellectual and moral worth. We intend, in behalf of the society whose interest we represent, to send our young correspondent the Cultivator; and should the association be matured, we shall feel bound to give a further evidence of our good wishes for its success. B.

"THE 'CULTIVATOR.'

"We have received the two first numbers of a new agricultural periodical, which will be issued monthly at Albany, New-York. It is published by the New-York State Agricultural Society, under the immediate direction of a committee of publication, composed of Messrs. J. Buel, J. P. Beekman and J. D. Wasson. Thus set on foot by the patronage of government, and sustained by editorial talents of the first order, and bestowed gratuitously, the "Cultivator" is furnished at the remarkably low price of fifty cents a year, or at twenty-five cents each for a subscription for twenty or more copies. The monthly sheet has sixteen pages large octavo. Its matter, so far, is good—and it cannot well be otherwise, while it has its present zealous and able conductors. We will take pleasure in receiving and transmitting subscriptions for this work.

"The price of this publication is fixed at this very low rate, for the purpose of inducing, if possible, every tiller of the soil in the state of New-York to buy, and to read it. This is a noble object—and the steps taken to reach it, cannot but have consequences highly useful to the agricultural community. But while this acknowledgment is made, and notwithstanding the high opinion expressed of the work, and the abilities of its conductors, we will venture to add our fears, that this good will be effected by the destruction of another of equal, if not of greater value—the excellent agricultural papers already established in the western part of N. York, by individual enterprise and capital, and which have rendered essential service to agriculture, at a very cheap rate—though not so cheap as to be able to compete with the *Cultivator*. It remains to be seen, whether this is the best mode of aiding the diffusion of agricultural knowledge, even putting aside the consideration of all losses of individuals. We are decidedly in favor of 'free trade'—and consider that it is as unjust, and as impolitic, for government to injure any employment of capital and industry, by competing with, and underselling individual laborers or traders, as it is to commit the more common error of enabling them to make exorbitant profits, by indirect bounties, or restraints which destroy fair and general competition.

"Besides—however great the amount of talent, zeal and influence with which the Cultivator is now conducted, it cannot be expected that such services are to be retained in steady operation, without the incentive of reward or emolumen . The conductors would be more than men, if they can toil without flagging, in so humble a vocation, merely from the impulse of patriotism. And if, indeed, they should become weary, it will take place after all the other agricultural papers of New-York have sunk, and the whole business of periodical instruction will be to re-construct.

"It may be thought that our fears are, in truth, for the Farmers' Register. This is not the case—for, though it may be mistaken, it *is* our opinion, that no periodical publication in New-York, can lessen the circulation of one in Virginia; nor can the latter injure one of the former. Any good agricultural journal, will be found instructive and useful to farmers of every other country; but still, the climate and system of husbandry of the state of New-York, differ so much from those of Virginia, that no such injurious competition can be maintained, no matter by what difference of price. On the contrary, the circulation of any such journal in a distant region, will increase the readers' inclination for similar supplies nearer home, and more generally suited to their wants. We should be pleased if the Cultivator could be seen and read by every farmer in Virginia: and believe, if such was the case, that but few subscribers of the Farmers' Register, would be thereby induced to give up the latter work—and very many others would be induced to become subscribers, by learning from so good a work, the great value of an agricultural journal, more particularly suited to their wants and habits."

The above article is from the "Farmers' Register, a monthly publication devoted to the improvement of the practice, and support of the interests of Agriculture," published at Richmond, Virginia, by Edmund Ruffin, Esq. The Register was commenced in 1833, has reached its twelfth number, and we understand, has an extended and numerous list of subscribers, to which it is constantly making additions. We have seen the numbers of the Register as they have successively appeared, and giving our judgment for as much as it is worth, would call it a publication of the first order for the kind. With its editor, we hope it will not be thought that we bandy compliments, when we say, that we think him peculiarly qualified for the work he has undertaken, and his publication for variety, clearness and interest, will compete with any thing of the kind, foreign or domestic, we have ever seen.

The Register in itself is very respectable in appearance, and its typographical execution is every way commendable. Virginia has reason to be proud of the work, and in due time it will produce a most salutary and decided influence upon its agriculture. We take it for granted it will succeed, for, in despite of the general unwillingness of the farmers to read, its own inherent force, conducted by its present editor, will ensure its circulation. Upon the subject of the Cultivator, we would inform the editor of the Register, that it is not under the patronage of government, and derives no aid from state munificence. The Cultivator must pay its own way. It has thrown itself upon the beneficence of the friends of agriculture, and hopes that from its enlarged subscription it will be enabled to maintain itself. Time must determine the result. At all events, if it does not meet with success, it will at least try to deserve it. Farther, it is but the mouth-piece of the New-York State Agricultural Society, without the promise of a cent from its treasury, or a name to its list; the only capital it draws from that source is its good will, which, as far as it goes, may assist it to trade more largely. Its resources, then, are in its subscribers; if they fail, the committee of publication alone are answerable. This committee would extremely regret that the Cultivator should, directly or indirectly, have an injurious effect upon any other agricultural journal, particularly those in this state. They have been the pioneers that have opened the way, and *created* a taste for agricultural reading, in which the committee, as individuals, in common with others, have largely participated; personally, therefore, we consider ourselves deeply indebted to those publications, and their editors must do us the justice to say that we are not prompted by avarice, because we have not the hope of its reward.

We thank Mr. Ruffin, and accede to his offer to take up subscriptions for the Cultivator, and would cheerfully reciprocate the good will, in transmitting names for the Farmers' Register.

THE CATERPILLAR.

J. Buel, Esq.—As much complaint is annually made of the ravages of the Caterpillar among the farmers' fruit trees, and particularly in apple orchards, I feel desirous of rendering some service to the public, by furnishing a remedy, which, from actual experiment, I am satisfied is effectual.

Place a sponge, or swab made of rags, on the end of a pole, saturate it with ley made from common wood ashes; with this preparation, give their nests a thorough washing early in the morning, before these mischievous animals have gone abroad for their food. This will instantly prove fatal to them. Be careful to break the web of the nest, because they are so constructed as to shed the rain and dews, and the animals will thus escape. Not one of them can live a minute after being wet with this liquid.

Yours respectfully,

Geneva, May 17. DAVID HUDSON.

J. Buel—I see you have an article in the Cultivator, directing how to destroy the caterpillar.

I will state what I know to be a fact, that is, take a pail of soap suds, and with a swab attached to the end of a pole, swab the nest in the morning, and it will kill the worms and destroy the eggs. It is the best remedy I ever saw, and the quickest and cheapest.

A. BRIDGES.

Milford, May 17.

It is better to bind men by kind offices than by fear.—*Livy.*

CANADA THISTLES.

The suggestions of our correspondent, in the following communication, that frequent ploughing will destroy the Canada thistle, is in confirmation of the practice of Mr. Hillhouse, as related in the May number of the Cultivator. The object of both gentlemen was the same—to prevent the plant from vegetating; whilst the one used the plough, the other substituted the hoe for that purpose, and both it appears were effectual; these communications contain important suggestions, and we have no doubt they will be acted upon by some of our farmers the coming season.

We have this moment been called upon by a neighbor to the gentleman who sent us the following communication, who says the practice of killing the thistle in the following instance, as related by our correspondent, was so completely successful, that where any are now left, this plan to subdue them is invariably resorted to—that a small farm in the vicinity was sold a few years ago at the modesate price of not more than $25 per acre, because the ground was almost covered with the thistle—that the method of frequent ploughing was adopted by the purchaser, and the thistles are so perfectly subdued, that hardly a single one can now be seen, and this same farm would now readily sell at double the original price. We cannot for a moment doubt the correctness of the above statements; and if frequent ploughing is the remedy to destroy the thistle, a knowledge of the fact ought to be most extensively diffused. A.

[*For the Cultivator.*]

I am happy to perceive the attention of a Subscriber is drawn to the destructipn of the Canada thistle. What he writes is from actual experience, the best school extant. The gentleman's mode of destroying that most noxious of all weeds, (the Canada thistle,) I conceive to be based upon just principles, viz. that of totally depriving it of a top through one summer. This is an effectual mode of eradicating them; but I think we may pursue a system of management, where there are large quantities of this thistle, in a more sure and effectual way, than the one in your May number of the Cultivator, signed a Subscriber. What I here state is also from actual experience. For the last four years, I had two farms which were harrassed more or less with the above named thistle, one of them being a small farm, was almost overrun with it, so much so, as to almost ruin both the grass and grain crops. My mode of treatment is, to plant the field one year; that will subdue the sod. The next year commence as soon as the thistles come up in the spring, to plough them, and continue to plough them, say once in two or three weeks, or as often as they come up or appear, until it is time to sow the field with winter grain. By this time the thistles, if attended to as directed, will be totally destroyed. I have killed, last season, full ten acres in this way; the season before, as many more, and three years ago, from one to two acres. Small spots may be wholly kept down, in pasture fields, by salting stock upon them, and at the same time see to them as often as once a week, that there are no tops left. If there are, strong brine, when the ground is moist, poured on them will kill them, but if you kill all there are in sight to-day, in one week, examine and you will find more, so that it requires attention, or else you will lose your labor; there is no half-way work about it; when they are bad in a stone wall, the best way is to remove it to some other place not infected with them. The number of times of ploughing required to kill mine, has varied from five to ten times, and when the ground is bare you can plainly see whether you have destroyed them or not.

If the above article should be the means of assisting the destruction of one square rod of ground, covered with the Canada thistle, the writer will be fully recompensed. A SUBSCRIBER.

Chatham, Columbia county, N. Y. May 12, 1834.

Cattle Husbandry.

MISCELLANEOUS NOTICES.

Before we proceed in our extracts in relation to the Short Horns, we will state some facts which may be interesting to the cattle farmer, in a brief way, which we glean from much that would be uninteresting to him in the work before us.

The Hereford, Sussex and Glamorganshire cattle, noticed in the above table, have probably sprung from the same origin as the North Devons. They are considered as belonging to the same general class. The Herefords are larger than the Devons, have generally white faces, throats and bellies, are of a dark red, sometimes brown or brindled. The Sussex are also larger but coarser, than the Devons, generally of a bright chesnut colour. The Glamorganshire is a Welch stock, smaller than the Devons, owing to the scanty food which the mountains yield. None of these breeds are considered equal to the Devons for the plough. The Herefords are far worse milkers than the Devons, and the same remark will apply to the other two kinds. The Leicester belongs to the class of *long horns*, of which we shall have occasion more particularly to speak hereafter.

Various attempts to improve the Devons in weight have been attempted, as with the Hereford, Sussex and Durham breeds: but with one exception they seem to have been unsuccessful: a single cross with the Herefords, obtained by stealth, is said to have produced some of the most perfect of the Devon family. A cross with the Guernsey has been thought to improve their quality for the dairy. The Devon stock sells high. They have sold as high as 100 guineas, and a lot of twelve cows, the stock of Mr. Rogers, averaged at public sale, £30 or $133 each.

Calves are preferred to be dropped late. They are permitted to suck three times a day for a week. They are then used to the finger, and warm new milk is given for three weeks longer. For two months after they have plenty of warm scalded milk, mixed with a little finely powdered linseed cake, (for which corn meal offers an excellent substitute) and entirely weaned at four months old.

"The grand secret of breeding is to suit the breed to the soil and climate." The Devons deteriorate in some counties, and improve in others.

Clouted Cream, considered in Devonshire a great luxury with coffee, tarts or strawberries, is thus prepared: The milk stands in a bell-metal vessel twenty-four hours, when it is placed over a small wood fire and heated gradually. In an hour and a half, when it is approaching a state of *simmering*, the vessel is struck every now and then with the knuckle, or is very carefully watched. As soon as it ceases to ring, or the first bubble appears, and before it boils, it is taken off and set by twenty-four hours more. At the end of this time, the cream will have become wholly separated, will be thick enough to cut with a knife, and may be skimmed off. The dairy people say there is economy in this process:—that five pounds of butter can be obtained in this way where only four could be obtained in the ordinary way, and that the butter is more saleable, on account of its pleasant taste.

To keep up in size and proof a good growth, it is deemed necessary to change the bull every two years. The Somerset farmers think that frequent bleedings, in small quantities, accelerate the process of fattening. The calves in this county are principally fed, if not intended to be fattened, on cheese-whey. The Herefordshire farmers insist, as the result of experience, that the breeding qualities of a cow are materially lessened, and that even her form is deteriorated, by her being inclined to give a large quantity of milk.

We find no comparison between the North Devons and the Short Horns, as to their facilities of fattening, in ordinary or extraordinary feeding. We insert, however, the following comparison of the latter, with the Herefords, a branch of the Devon or middle horned stock;

"Three Herefords and three Short Horns were selected; they were put together in a straw yard on the 27th December, 1827, and were fed in the open yard, at the rate of one bushel of turnips per beast per day, with straw only, until May 2, 1828, when their weights were taken, and they were sent to grass.

No.		cwt.	qrs.	lbs.	No.		cwt.	qrs.	lbs.
1	Hereford,....	8	3	0	1	Short Horns,	9	2	0
2	do	7	3	0	2	do	8	2	0
3	do	7	0	0	3	do	9	0	0

On the 3d November, they were taked from grass, and put into the stable, when their weight was as follows:

No.		cwt.	qrs.	lbs.	No.		cwt.	qrs.	lbs.
1	Hereford,. ..	11	3	0	1	Short Horns,	12	3	14
2	do	10	2	0	2	do	12	2	0
3	do	10	3	0	3	do	12	3	0

From that time to the 25th March, 1829, they consumed the following quantities of Swedish turnips and hay:

	Turnips, lbs.	Hay, lbs.
The Herefords,.....	46,663	5,065
The Short Horns, ...	59,430	6,779

They then weighed—

No.		cwt.	qrs.	lbs.	No.		cwt.	qrs.	lbs.
1	Hereford,....	13	0	14	1	Short Horns,	14	2	0
2	do	12	0	0	2	do	14	1	14
3	do	12	0	0	3	do	14	2	14

being an increase of weight in favor of the Short Horns, of 17 2 0
and in favor of the Herefords, of..... 13 3 14

and making a difference in favor of the Short Horns, of 3 2 14
but then the Short Horns had consumed 12,775 lbs. more of turnips and 1,714 lbs more of hay.

"When they were all sold together at Smithfield, on the 30th March, the heavier Short Horns fetched £97, and the lighter Herefords £96, being an overplus of only £1, to pay for the enormous difference in the food consumed, and the greater price given on account of the heavier weight of the Short Horns at the commencement of the experiment."

In *Gloucester*, celebrated for its cheese, and where the dairy is the great object, a great mixture prevails, though the *middle horn* varieties preponderate. The cows yield from four to six gallons of good milk per day. The calves are reared here pretty much in the same way as in Devonshire, as already noted—on skimmed milk, whey and linseed tea. Manured pastures are considered prejudicial to the dairy. The milk from them may be more abundant, but is not so rich. A farmer had two adjoining fields, one of them richly manured. His cows were put in each in alternate weeks. When running in the manured ground, the cheese was rank, heavy and hollow, and unfit for the market: when in the other, excellent cheese was made. Frequent changes in pasture are beneficial; as nothing is more conducive to the general health of the animal, as well as the abundant supply of milk, as the first flush of grass in the spring, after mowing, or in fresh pasture.

Our hilly lands are adapted to permanent pasture, to the dairy and sheep husbandry. Neither will ultimately be found to succeed well upon heavy wheat land, or upon the lighter soils adapted to alternate husbandry. The counties upon the head waters of the Hudson, Mohawk, Susquehannah, Delaware and Allegany rivers, are destined to be our great sheep and dairy districts.

As the *double* Gloucester cheese is in great repute, we shall briefly describe the process of making it, merely premising, that the cause of its superior quality is not satisfactorily known—some ascribing it to the soil, or rather pasture grasses, and others to the process of manufacture.

The milk is set at a temperature of 85 deg. which it is desirable should be natural, that is, from the cow, rather than artificial, by heating. The colouring matter and rennet are then added—the rennet old and free from smell. The process of cutting and breaking the curd follows next; and when it is sufficiently broken it is put into vats, and pressed well down. These vats are here, or rather in New-England, termed *cheese hoops*. The vats are filled as closely as possible—the cheese cloth placed over all, and a little hot water is poured over the cloth, *to harden the outside of the cheese*; the curd is then turned out into the cloth, and this being carefully folded round it, the cheese is returned once more into the vat. All the vats which are to be filled are to be placed one upon another, and are subjected to the action of the press. Here they remain twenty-four hours, the vats of the next meal being placed underneath, and those of the preceding meal raised a tier, and dry cloths occasionally applied. In many dairies there is a second breaking of the curd, which, after having been reduced as small as possible, is scalded with a mixture of water and whey. The second and more perfect breaking down of the curd has been imagined to be the grand cause of the soft uniform substance of the cheese when it is fully made. The practice is, however, getting somewhat into disuse; for it is reasonably urged that this scalding and washing must extract a portion of the oleaginous part of the cheese, as washing in water dissipates this and the aroma of butter; therefore a great deal more care is taken in sufficiently reducing it with the knife, rapidly worked about the tub before the curd is put into the vat. The old farmers, however, maintain, that the whole art of making Gloucester cheese depends on the scalding process; that the salty matter of the milk and curd is thus disposed to develop itself, and to be brought so far out, as to form afterwards the uniform rich substance for which the Gloucester cheese is celebrated. No salt seems to be put into the curd: but after twenty-four hours, the cheeses are well rubbed with salt; and this is repeated daily for four days.—The cloths are now taken away, and the cheeses regularly returned to the press for four, or five, or six days, according to the state of the weather. They are then put upon the shelf, and turned twice in the day, for two or three days; and then placed in the cheese room, where they are turned once in a day for a month. They are then scraped clean, and painted red or brown, which in a few days is rubbed from the edges and the cheese is continued to be turned once or twice every week. To prepare the rennet *two months before it is to be used*, 12 pounds of salt are boiled in 12 gallons of water till the liquid will bear an egg; then strained, and 24 "vells," or stomachs, and 12 lemons with the rinds on, but incisions made into them, and two ounces of cloves and cinnamon, are then put into the liquor. The "single Gloucester," is *skim-milk cheese!* and it is common to take cream enough from the "double" to serve the family.

We cannot refrain from intruding here, honorable mention of an Otsego dairy woman. Mary Brown, the worthy consort of Lemuel Brown, of Edmeston, made the last summer, forty-seven hundred pounds of cheese from thirteen cows. The quality of this cheese is not excelled by hardly any that comes to market. It sold at nine cents the pound. But what is worthy of particular notice is, that Mrs. Brown's cheese was not "single Gloucester," made of skim-milk, nor "double Gloucester," deprived of a part of the cream, but real "*double Otsego*," with every particle of the cream incorporated with the curd. Mrs. B. remarks that every pound of butter made from cheese milk, diminishes the cheese two pounds in weight, and one or two cents in price. Mrs. Brown's example should be commended by every lover of good cheese.

In Sussex, stall feeding is much practised. Lord Egremont has his milch cows tied up the greater part of the year, alleging that he thereby saved one-third of the food—that the cows were fed with a fourth part of the usual trouble—that more dung was made—and that there was no poaching the ground. Mr. Glynde, a skilful farmer, found that nine oxen fed loose in the yard, ate and destroyed as much as twelve oxen that were tied up. The average weight of the Sussex ox, when fitted for market, is stated at 16 and 17 cwt. and they have gone as high as 3,000 lbs. Oxen are worked three days in a week, in winter, and fed upon straw: and when they will not bear hard work, and hard food, they are turned off to fatten. The bull is changed every two years by the best breeders, from the supposition that the breeding *in-and-in* will cause the stock to degenerate.

In Glamorganshire and Cardiganshire, butter is the main object, and good cows average one hundred weight in the dairy season.

Science of Agriculture.

PULVERIZATION.

The mechanical division of the parts of soils is a very obvious improvement, and applicable to all in proportion to their adhesive texture. Even a free silicious soil will, if left untouched, become too compact for the proper admission of air, rain and heat, and for the free growth of the fibres; and strong upland clays, not submitted to the plough or spade, will in a few years, be found in the possession of fibrous rooted perennial grasses, which form a clothing on their surface, or strong tap rooted trees as the oak, which force their way through the interior of the mass. Annuals and rementaceous-rooted herbaceous plants cannot penetrate into such a soil.

The first object of pulverization is to give scope to the roots of vegebles, for without roots no plant will become vigorous, whatever may be the richness of the soil in which it is placed. The fibres of the roots take up the extract of the soil by introsusception. The quantity taken up, therefore, will not depend alone on the quantity in the soil, but on the number of absorbing fibres. The more the soil is pulverized, the more the fibres are increased, the more extract is absorbed, and the more vigorous does the plant become. Pulverization, therefore, is not only advantageous previous to planting and sowing, but also during the progress of vegetation, when applied in the intervals between the plants.

[Hence the utility of using the harrow and cultivator, in rowed crops, as corn, potatoes, ruta baga, &c. even when there are no weeds to be destroyed, or hilling required—and hence the utility of using the harrow, in spring upon winter grain.]

Pulverization increases the capillary attraction, or sponge-like properties of soils, by which their humidity is rendered more uniform. It is evident this capillary attraction must be greater where the par-

ticles of the earth are finely divided; for gravels and sands hardly retain water at all, while clays not opened by pulverization or other means, either do not absorb water, or when, by long action it is absorbed, they retain too much. Water is not only necessary to the growth of plants, as such, but it is essential to the production of extract from vegetable matters which they contain; and, unless the soil, by pulverization or otherwise, is so constituted as to retain the quantity of water requisite to produce this extract, the addition of manures will be in vain. Manure is useless in vegetation till it become soluble in water, and it would remain useless in a state of solution, if it so abounded as wholly to exclude air, for then the fibres or mouths, unable to perform their functions, would soon decay and rot off. Pulverization in a warm season is of great advantage in admitting the nightly dews to the roots of plants. Chaptal relates the great benefit he found in the practice in this respect to his corn crops; and shows of what importance it is in the culture of vineyards in France.

The temperature of a soil is greatly promoted by pulverization.—Earths, Grisenthwaite observes, are also among the worst conductors of heat with which we are acquainted, and consequently it would be a considerable time before the gradually increasing temperature of spring could communicate its genial warmth to the roots of vegetables, if their lower strata were not heated by some other means. To remove this defect, which always belongs to a close compact soil, it is necessary to have the land open, that there may be a free ingress of the warm air and tepid rains of spring.

Pulverization contributes to the increase of vegetable food. Water is known to be a condenser and solvent of carbonic acid gas, which, when the lands are open can be immediately carried to the roots of vegetables, and contribute to their growth; but if the land is close, and the water lies on or near the surface, then the carbonic acid gas, which always exists in the atmosphere, and is carried down by the rains, will soon be dissipated. An open soil is also most suitable for effecting those changes in the manure itself, which are equally necessary to the preparation of such food. Animal and vegetable substances, exposed to the alternate action of heat, moisture, light and air, undergo spontaneous decomposition, which would not otherwise take place.

By means of pulverization a portion of atmospheric air is buried in the soil. This air, so confined, is decomposed by the water retained in the earthy matters. Ammonia is formed by means of the hydrogen of the water with the nitrogen of the atmosphere; and nitre by the union of oxygen and nitrogen: the oxygen may also unite with the carbon contained in the soil, and form carbonic acid gas, and carburetted hydrogen. Heat is given out during the process, and hence, as Darwin remarks, the great propriety of cropping lands immediately after they have been comminuted and turned over; and this the more especially, if manure has been loose, and the interstices filled with air, than afterwards, when it becomes compressed with its own gravity, and relaxing influence of rains, and the repletion of the partial vacuums formed by the decomposition of the enclosed air. The advantage of the heat thus obtained in exciting vegetation, whether in a seed or root, especially in spring, when the soil is cold, must be very beneficial.

The depth of pulverization, Sir H. Davy observes, must depend upon the nature of the soil and subsoil. In rich clayey soils it can scarcely be too deep; and even in sands unless the subsoil contains some principles noxious to vegetables, deep comminution should be practised. When the roots are deep, they are less liable to be injured either by excessive rain or drought; the radicles are shot forth into every part of the soil; and the space from which this nourishment is derived, is more considerable than when the seed is superficially inserted in the soil.

Pulverization should, in all cases, be accompanied by the admixture of the parts of soils, by turning them over. It is difficult, indeed, to pulverize without effecting this end, at least by the implements in common use; but if it could be effected it would be injurious, because the difference of gravity between the organized matters and the earths has a constant tendency to separate them, and stirring a soil only by forks and pronged implements, such as cultivators, would, in a short time, leave the surface of the soil too light and spongy, and the lower part too compact and earthy.—*Enc. Ag.*

The Primitive Earths—are four, viz: clay, sand, lime, and magnesia. These are the only earths which enter into the composition of soils; they also enter in very minute portions into the organization of plants. Sand and clay are by far the most abundant; lime is required but in small proportion: every soil, however, is defective without it. Magnesia is found but in a few soils; its place is well supplied by lime; its entire absence, therefore, is not considered any defect.

Miscellaneous.

"THE USE OF LIME IN AGRICULTURE.

"*Bennington, Vt. April 7th*, 1834.

"Sir—I saw it stated in your report to the New-York State Agricultural Society, that Dr. Wm. Darlington, of Penn. had made a communication to the society on the 'use of lime in agriculture.'

"If it has been published, I would thank you to send it to me, if you can do it without too great inconvenience. I find it exceedingly difficult to obtain the necessary information upon this point; indeed all that I have, has been obtained from English publications, not entirely suited to this country. I am fully convinced that lime is as necessary upon our lands, especially those which have been highly manured, as the manure itself, and if properly manufactured, will cost much less and be more durable. I began with one or two loads per year, but increased the quantity each year, and shall probably use twenty loads the present season.

"Excuse me, if you please, for troubling you. I know of no other way to obtain the communication. Yours, &c.

"HAMILTON GAY.

"J. P. Beekman, *Cor. Sec'y N. Y. S. A. Society.*"

The communication to which our correspondent refers in the foregoing letter, was published in the proceedings of the New-York State Agricultral Society for 1833, and as it was printed at the expense of the society, but a few hundred copies were stricken off for the use of its members. As extensive a circulation has not been given to the communication of Dr. Darlington, on the use of lime in agriculture, as its intrinsic merits and the wants of the public require; it being now called for, we are happy in having an excuse for its re-publication in the columns of the Cultivator, to diffuse it more extensively, in hopes our readers will avail themselves of the information contained in it, to make a more general use of lime as a manure. Lime, as an agent in fertilization, has been, in this country, comparatively but little used; all, however, who have tried its powers, unite in ascribing to it a strong and quickening influence on vegetation, and the letter of Dr. Darlington will be the more useful to the public, because he avails himself as well of the experience of his practical neighbors, as his own, to treat of this subject in a most clear and satisfactory manner. The publishers of the Cultivator would be pleased to receive the result of their Vermont correspondent's future observation, on the use of lime as a manure, should he be induced to give it a thorough trial; and they will now add this general observation, that in those districts of country where it has been extensively, and for some time used, the per acre price of land has been greatly, and we presume proportionately increased. Hereafter, we must again take up this subject, because it is an extensive field for investigation, in which farmers, as well as men of science are interested, and both will be most amply rewarded, should any farther lights be elicited on so important and useful a topic.

Letter from Dr. William Darlington, of Pennsylvania, on the use of Lime in Agriculture.

Westchester, (Penn.) Dec. 17, 1832.

Dear Sir,—Your etter, containing a number of *queries* relative to the operation and utility of *lime*, in the process of agriculture, was received in the arly part of June last: But as I have been much engaged, during the past summer, with duties which required all my attention,—and, as your letter intimated that answers furnished "any time during the present year" would be in season for your purposes,—I have taken the liberty to postpone my reply until now.

I proceed then, with great pleasure, to furnish you with such facts and remarks as my opportunities for observation have enabled me to offer. With a view to render the answers more explicit and satisfactory, I will annex them, *seriatim*, to your several inquiries.

Query 1. "*Upon what lands does lime operate most beneficially,*—1. *In regard to geological formation,—as primitive, transition, secondary, and alluvial?*

2. *In reference to the soil,—as sand, clay, lime, and vegetable matter!*

3. *As indicated by natural growth of timber and plants?"*

Answer. My residence has always been in a *primitive* region, and my observations very much limited to agricultural processes in soils upon that formation. The prevailing rock here is gneiss,—with occasional beds, or veins, of hornblende, greenstone and sceinite. About five miles to the north of us, is the great valley of transition limestone, stretching from northeast to southwest; and immediately on the northern side of this valley, running parallel with it, is a broken ridge of hills, formed of mica slate,—with beds of serpentine rock and hornblende, on the side next to the gneiss rock, on the southeast. Over the gneiss rock, and among the hornblende, the soil is generally a stiff loam; and there, I think, the best effects are perceptible from a given quantity of lime. On the soil overlaying the schistose rock, the good effects of lime are sufficiently obvious, under the management of skilful farmers; but the benefits seem to be less permanent. On the serpentine rock the soil is extremely sterile,—and neither lime nor barnyard manure can be used with much advantage. In the limestone soil of the great valley, where one would suppose it was already redundant, lime is used with advantage; and much heavier dressings are put on, than in the adjacent districts. I cannot furnish the *rationale* of this practice; but I believe the fact is established, that more lime is required to produce the same beneficial effect on soils resting on limestone rock, than upon those overlaying gneiss,—and perhaps some other primitive rocks.

I have had no opportunity to witness the effect of lime upon *secondary*, and strictly *alluvial*, formations; but the above circumstances has led me to suspect, that the *same quantity* of lime would not be so signially beneficial in secondary, as it is in certain primitime formations.

Lime, undoubtedly, has a good effect in soils which are *sandy*,—even where sand predominates; but I believe its meliorating properties are most conspicuous in a *clay* soil,—or rather in a *stiff loam*.—A good proportion of decomposed vegetable matter adds greatly to the beneficial effects of lime; and hence our farmers are desirous to mingle as much barnyard manure as possible with their lime dressings,—and to get ther fields into what is called a good sod, or turf, -- full of grass roots. *Then* a dressing of lime has an admirable effect.* The soils indicated by a natural growth of black oak, (*quercus tinctoria*) walnut, (*juglans nigra*) and poplar, (*liriodendron*)—and those in which such grasses as the *poas* and *festucas* best flourish, are generally most signally benefitted by the use of lime. In short, I may observe, that lime has been found more or less beneficial in every description of soil in this district. It is most so on hilly, or rolling lands, where clay predominates,—less permanently, so among the mica slate;—and least of all, on the magnesian rocks. The soil on these last is rarely worth cultivating.

Query II. "*What quantity of lime applied to the acre, upon different soils, at a single dressing, and during a period of years?*"

Answer. The quantity of lime, per acre, which can be used advantageously, varies with the condition and original character of the soil. Highly improved land will bear a heavier dressing than poor land. On a soil of medium condition, the usual dressing is 40 to 50 bushels per acre. A deep, rich soil, or limestone land in the great valley, will receive 70 to 80—(and I am told even 100,) bushels to the acre, with advantage. On very poor land, 20 to 30 bushels per acre, is deemed most advantageous to commence with. It is usually *repeated* every five or six years—i. e. every time the field comes in turn to be broken up with the plough; and as the land improves, the quantity of lime is increased. The prevailing practice here, is to plough down the sod, or *lay*, in the fall or early in the spring,—harrow it once—and then spread the lime (previously slaked to a powder) preparatory to planting the field with Indian corn. Every field, in rotation, receives this kind of dressing; and as our farms are mostly divided into about half a dozen fields, the dressing of course comes once in six years, more or less according to the number of the fields. Some enterprising farmers, however, give their fields an *intermediate* dressing, *on the sod*, after they come into grass, which I consider an excellent practice,—tending rapidly to improve the condition of the land.

Query III. "*Is it applied in a caustic or an effete state?*"

Answer. It is usually obtained in a caustic state from the kiln,—deposited in heaps in the field where it is to be spread, and water sufficient to slake it to a powder, is then thrown upon it. As soon as slaked, it is loaded into carts, and men with shovels distribute it as equally as possible over the ground. It is generally considered best to put it on the ground whilst it is fresh, or *warm*, as the phrase is; and it is certainly easier to spread it equally, while in a light pulverized state, than after it gets much wet with rains. I am inclined to think, too, it is better for the land when applied fresh from the kiln.

Query IV. "*To what crops is it most advantageously applied, and at what season?*"

Answer. It is usually applied, as already intimated, to the crop of *Indian corn*, in the spring of the year—say the month of April. Occasionally it is applied preparatory to sowing wheat in autumn. When used as a *top dressing*, on the sod, it is generally applied in the fall—say November. The prevailing impression is, that it is most advantageously applied to the Indian corn crop; and hence the general practice. But the truth is, it is highly advantageous at any, and at all seasons; and our shrewd old farmers have a saying—"*Get your lime on for your corn, if you can,—but be sure to get it on the land, some time in the year.*"

Query V. "*How is it incorporated with the soil—by the plough or the harrow? and is it applied in any case as a top dressing to grass and to grains, and with what effect?*"

Answer. As already stated, after the sod is ploughed down for Indian corn, it is usually harrowed once, to render the surface more uniform. The lime is spread as equally as possible over the field,—and then the ground is well harrowed in different directions, in order to incorporate the lime with the soil. Soon afterwards the field is marked out, and planted with corn. The plough is rarely, if ever used for the purpose alluded to. I have mentioned above, that lime is occasionally used as a top dressing for grass. It appears to be particularly beneficial to that crop; and answers extremely well when applied in that manner. The practice of applying it to Indian corn, as above related, is however, chiefly followed; and the application of a dressing to each field, in rotation, causes as much labor and expense every year, as our farmers generally are willing to incur. Lime has rarely been used as a top dressing to *grain* crops, within my knowledge.

Query VI. "*What is the ordinary cost, per acre, of liming, and the relative profits, in increased products of a period of years?*"

Answer. Quick lime, at the kilns, usually costs twelve and a half cents per bushel. The farmers generally haul it with their own teams; and the additional expense depends, of course, materially upon the *distance*. It is frequently hauled by them a distance of eight, ten, and even twelve miles. The average, perhaps, is about five or six miles. It is delivered to me by the lime burners, (a distance of near 6 miles,) at 18 cents per bushel. At the rate of 40 bushels to the acre, the cost, at 18 cents, would be $7.20 cents per acre. It is difficult to estimate, with precision, the relative profits in increased products: But I can safely say, from my own experience, on a small farm of middling quality, that two dressings of lime at the above rate, in the course of 8 or 9 years, have more than trebled the products of the land to which it was applied, both in grain and grass. It is to be understood, however, that the system of *ploughing only so much ground as could be well manured*, was adopted at the same time. I may also observe, generally, that the farmers of this district, (who are shrewd economists) are so well convinced of the beneficial effects of liming, that costly as its application seems to be, they are unanimous in sparing no effort to procure it. Lime has been found to be peculiarly favorable to the growth of pasture, when the farm is otherwise well managed; and as our farmers are mostly in the practice of feeding cattle, they resort to liming as an indispensible auxiliary to successful grazing.

Query VII. "*Is lime applied with yard manures, or earthy composts, and with what results?*"

Answer. I have already intimated that vegetable matters, and especially yard manures, are highly important in conjunction with lime. Both are valuable, even when used separately; but when *combined*, the effect is most complete. If to this be added, the great secret of good farming, viz. to plough only so much ground as can

* The yard manure is not usually mingled with the lime, when the latter is first applied. The practice is, to lime the *Indian Corn* ground prior to planting that grain on the inverted sod,—and, the ensuing spring, to manure the same field for a *barley* crop,—or, to reserve the manure until the succeeding autumn, and apply it to the *wheat* crop. It is not well settled which of these is the better practice. Each has its advocates; but it is most usual to reserve the manure for the wheat.

be well manured,—the state of agriculture may be considered nearly perfect.

Lime is, in some instances, added to earthy composts, preparatory to distribution on the fields: But it is doubtful whether the extra labor of this method is compensated by any peculiar advantages. It is not generally practised.

Query VIII. "*Is powdered limestone (carbonate of lime) applied to soils; and if so, does it induce fertility otherwise than by mechanically ameliorating their texture?*"

Answer. No instance of powdered limestone being applied to soils has come under my notice. I can, therefore, form but a very imperfect opinion of its utility. If it were even as beneficial as quick lime (which I doubt) I apprehend it could not be procured and applied with less cost and labor.

Query IX. "*On what soils, if any, in your neighborhood is lime found to be inoperative, as a fertilizing application; and the cause of its failure?*"

Answer. There is no soil in this district deemed worthy of cultivation, on which lime is *wholly* inoperative as a fertilizer. On some sterile, slaty ridges, and on magnesian rocks, it has indeed but a slight effect; and even the benefits of barnyard manure are very transient. In low, swampy grounds, also, unless they are previously well drained, the labor of applying lime is pretty much thrown away. There seems to be something in the constitution of magnesian rocks peculiarly unfriendly to the growth of the more valuable plants. Indeed there are patches of the soil perfectly destitute of all vegetation. Repeated attempts have been made to cultivate the bases of our serpentine banks; but neither lime, nor manure, will enable the farmer to obtain more than a light crop of small grain. Neither clover, nor the valuable grasses can be induced to take root and flourish in the ungenial soil. It is, therefore, almost universally neglected.

I have thus endeavored, (in rather a desultory manner, I confess) to answer your queries according to my best judgment. If what I have furnished shall in any degree tend to make the subject better understood, I shall be amply gratified.

With great respect, I have the honor to be, your ob't servant,

WM. DARLINGTON.

JESSE BUEL, Esq. *Cor. Sec'y, &c*

[*From the Memoirs of the Board of Agriculture.*]

REMARKS ON CUTTING OATS AND INDIAN CORN—MAKING AND APPLYING MANURES—ROTATION OF CROPS, &C.—BY PHILEMON HALSTED, OF WESTCHESTER.

To JESSE BUEL, Esq.—Dear Sir—Being honored with a circular from the Board of Agriculture, I will offer a few experiments which have proved to me of great advantage.

In the first place, every landholder who tills the ground should be very careful to provide and make manure by all possible means in his power; and this he may do to a considerable extent. He should provide himself with as much fodder as will winter more cattle than he can summer; and this is done in the following manner: Cut your oats when the straw is green in part; let them lay and cure in the swath until they are sufficiently dry not to mould; bind them in sheaves, and stack them. When they are thrashed, the farmer will find that his oats will thrash to greater advantage. The light oats sticking to the straw, makes it good fodder, and I consider it of as much value as will pay the expense of raising the oats.

Secondly, give up the old method of cutting your top-stalks; and when your corn is sufficiently hard, or when you cannot find an ear soft enough to boil and eat, then proceed to cut and stout your corn in the field, in the following manner: Bring the tops of two hills together, without cutting: bind them with a few spears of straw: then cut and set up about enough to make four sheaves, if bound; then put on a band of straw about the top; and then you may add as many more, and bind the whole with two bands, always keeping the bottom of the stout open, so as to admit the circulation of air. At the proper time of gathering corn, you may proceed thus: Throw down the stout, unbind and begin to gather the corn; when you have stalks enough for a sheaf, bind them and lay it aside until you have enough for a stout. By this you save all the silk and small husks and under leaves of the corn, which were all lost by the former pactice of topping and gathering corn. I will recommend that the stalks be stacked on a hovel, or poles laid on crotches, and foddered in the yard. I have been particular as to the time it takes in this process, and can say I am satisfied it takes no more time than in the old method.

The farmer should embrace every open spell in the winter to collect from his milking yard the scrapings, and also from the pond, holes and hollows in his woods the leaves and dirt, and draw and spread them in his yard or yards. This will enable him to make, (by the help of twenty head of cattle) one hundred loads of manure; which will be fit to put on the ground the next autumn, at the rate of twenty loads to the acre; which, if ploughed in, and the land sowed with wheat or rye, and seeded with timothy seed at the same time, and clover the next spring, it will produce a burden that will be satisfactory to the owner, and the ground will be in better condition than when first ploughed.

It may not be amiss to mention what kind of cattle a farmer can winter on such fodder as I have spoken of. I would recommend that he buy, in the fall, young heifers of good quality, and good looking young cows; and if his situation permits, a pair or two of steers broken to the yoke; all of which are in demand in the spring, and will advance in price sufficient to pay for the wintering, and leave for his advantage a yard full of good manure. I will also recommend attention to be paid to the hog-pen, and as much litter, weeds and refuse from the gardens and yards, as can be procured, and by a careful mixture of some good black earth, the quantity of manure may be swelled to a large amount. As almost all landholders have on their farms ponds or swamps, that are miry, I will recommend that they draw out, in the month of August, when most of swamps are dry, a large quantity, and put it in a heap, and there let it lay until the next spring, when it will be fit to put on corn in the hill, and will have a very great effect. If, after the operating of the frost on the heap, the compost should crumble, and have a proportion of dust, it is then good. If it should dry hard and lumpy, like clay, it is only fit to be put in the barn-yard or hog-pen, and be trodden in with the compost. By application of pond manures as above, I have been enabled to make some poor land become very productive.

As I have given some practical remarks on the making of manure, I shall now proceed to state my process of culture. I break the ground in the month of April, and have the sod turned under by one of Freeborn's ploughs, about eight inches deep; (and here it is that many make great blunders, and much to their disadvantage, by not attending in person, and having their ground ploughed deep and well;) and then harrowed with an iron tooth harrow, or wood will do, if it be heavy, and the teeth made of good hickory, and kept sharp. Harrow the same way you have ploughed, until your ground is well mellowed; then, when you see the earliest apple-tree begin to drop its blossoms, furrow your ground three feet apart at right angles, and plant four grains of corn in a hill.

Almost every farmer has some method of steeping his corn before planting, and rolling it in either plaster, ashes, lime, or tar; all of which, at some times, are an advantage, and at other times a disadvantage. After my corn comes up, and is sufficiently large to be seen in rows, I commence ploughing and hoeing, and continue it until the corn begins to shew signs of setting for ears, being particular to keep the plough a going in dry weather. By the above culture, I have been enabled to collect from fifty to eighty bushels per acre; and by mixing pumpkin seed, and planting it with the corn, I have raised four ox cart loads to the acre.

I have already described my method of collecting and preserving the tops and bottom stalks for fodder. I shall proceed to my next crop, the next spring, which shall be corn, and a proportion of potatoes; giving the preference to corn, on account of the great quantity of fodder. And this year tilling, I break up the sod which laid last year beneath the furrow of corn plough; thereby I am enabled again to raise a good crop of corn, and subdue all the wild grass, roots and weeds which laid at the bottom of the furrow. Third year, I split the corn hills with a plough, harrow the ground well, then plough, harrow again, and sow my oats and flax. My oats will produce about forty bushels, and upwards, per acre, depending on the season for their yielding; and my flax will average sixteen bushels of seed, and three hundred weight to the acre. I will observe, that where the ground is strong, and the oats very forward, they ought to be fed off to the ground, before they have a joint. This prevents their lodging, and gives the under oats an opportunity to come forward, which will much increase the quantity. The oat stubble and flax ground should soon be ploughed, harrowed and cross-ploughed; then draw on your manure, about twenty ox cart loads to the acre; spread and plough it in as soon as possible. If you intend to sow rye, put it in about

the first of September, and sow your timothy seed after the harrow, eight quarts to the acre; then use a roller, which breaks the lumps. It may be fed off during the fall, by calves, colts, or sheep, without any disadvantage. If you intend it for wheat, sow it about the twenty-fifth of September, and follow the same method as with the rye: sow clover in the spring, when the ground is open in cracks, about six pounds to the acre. By following the above directions, I have always realized a good crop of grain, and a great crop of grass; and the ground may and ought to remain in sod six years, before ploughed again.

[*From the Memoirs of the Board of Agriculculture*]

REMARKS ON THE CONSTRUCTION AND MANAGEMENT OF CATTLE YARDS.

By J. Buel, of Albany.

Vegetables, like animals, cannot thrive or subsist without food; and upon the quantity and quality of this depends the health and vigor of the vegetable, as well as of the animal. Both subsist upon animal and vegetable matter—both may be surfeited with excess—both may be injured by food not adapted to their habits, their appetites, or their digestive powers. A hog will receive no injury, but great benefit, from free access to a heap of corn or wheat, where a horse or cow will be apt to destroy themselves by excess. The goat will thrive upon the boughs and bark of trees, where the hog would starve. The powerful robust maize will repay, in the increase of its grain, for a heavy dressing of strong dung; for which the more delicate wheat will requite you with very little but straw. The potato feeds ravenously, and grows luxuriantly, upon the coarsest litter; while many of the more tender exotics will thrive only on food upon which fermentation has exhausted its powers. But here the analogy stops: For while the food of the one is consumed in a sound, healthy, and generally solid state, the food of the other, before it becomes aliment, must undergo the process of putrefaction or decomposition, and be reduced to a liquid or æriform state.

I have gone into the analogy between animals and vegetable thus far, to impress upon the minds of our farmers the importance of saving, and of applying, the food of their vegetables with the same care and economy that they do the food of their animals. How scrupulously careful is the good husbandman of the produce of his farm, destined to nourish and fatten his animals; and yet how often careless of the food which can alone nourish and mature his plants! While his fields are gleaned, and his grain, hay and roots carefully housed, and economically dispensed to his animals, the food of his vegetables is suffered to waste on every part of his farm. Stercoraries we have none. The urine of the stock, which constitutes a moiety of the manure of animals, is all lost. The slovenly and wasteful practice of feeding at stacks in the fields—where the sole of the grass is broken, the fodder wasted, and the dung of little effect—is still pursued. And finally, the little manure which does accumulate in the yards, is suffered to lay till it has lost full half of its fertilizing properties, or rotted the cills of the barn; when it is injudiciously applied, or the barn removed to get clear of the nuisance. Again—none but a slothful farmer will permit the flocks of his neighbors to rob his own of their food; yet he often sees, but with feeble efforts to prevent it, his plants smothered by pestiferous weeds, and plundered of the food which is essential to their health and vigor. *A weed consumes as much food as a useful plant.* This, to be sure, is the dark side of the picture; yet the original may be found in every town, and in almost every neigborhood.

It is surprizing, that under such management, our arable grounds should grow poor, and refuse to labor its accustomed reward? Can it be considered strange, that those who thus neglect to feed their plants, should feel the evil of light purses, as well as of light crops? Constant draining or evaporation, without returning any thing, would in time exhaust the ocean of its waters. A constant cropping of the soil, without returning any thing to it, will in like manner exhaust it of its vegetable food, and gradually induce stertility. Neither sand clay, lime or magnesia—which are the elements of all soils—nor any combination or part or all of them, is alone capable of producing healthy plants. It is the animal and vegetable matter accumulated upon its bosom, or which art deposites there—with the auxiliary aid of these materials diffused in the atmosphere—that enables the earth to teem with vegetable life, and yield its tribute to man and beast.

I will now suggest a cheap and practicable mode of *providing food for vegetables*, commensurate to the means of every farmer of ordinary enterprise; and that my suggestions may not be deemed theoretical, I will add, that I "pactice what I preach."

The cattle-yard should be located on the south side of, and adjoining the barn. Sheds, substantial stone walls, or close board fences, should be erected at least on the east and west sides, to shelter the cattle from cold winds and storms—the size proportioned to the stock to be kept in it. Excavate the centre in a concave form, placing the earth removed upon the edges or lowest sides, leaving the borders ten or twelve feet broad, and of a horizontal level, to feed the stock upon, and from two or five feet higher than the centre. This may be done with a plough and scraper, or shovel and hand-barrow, after the ground is broken up with the plough. I used the former, and was employed a day and a half, with two hands and a team, in fitting two to my mind. When the soil is not sufficiently compact to hold water, the bottom should be bedded with six or eight inches of clay, well beat down, and covered with gravel or sand This last labor is seldom required, except where the ground is very porous. My yards are constructed on a sand loam, resting on a clay subsoil. Here should be annually deposited, as they can be conveniently collected, the weeds, coarse grass, and brake of the farm; and also the pumpkin vines and potato tops. The quantity of these upon a farm is very great, and are collected and brought to the yard with little trouble by the teams returning forom the field. And here also should be fed out, or strewed as litter, the hay, stalks and husks of Indian corn, pea and bean haulm, and the straw of grain not wanted in the stables. To still further augment the mass, leached ashes and swamp earth may be added to advantage. These materials will absorb the liquid of the yard, and, becoming incorporated with the excrementitious matter, double or treble the ordinary quantity of manure. During the continuance of the frost, the excavation gives no inconvenience; and when the weather is soft, the borders afford ample room for the cattle. In this way the urine is saved, and the waste incident to rains, &c. prevented. The cattle should be kept constantly yarded in winter, except when let out to water, and the yard frequently replenished with dry litter. Upon this plan, from ten to twelve loads of unfermented manure may be obtained every spring for each animal; and if the stable manure is spread over the yard, the quality of the dung will be improved, and the quantity proportionably increased. Any excess of liquid that may remain after the dung is removed in the spring, can be profitably applied to grass, grain or garden crops. It is used extensively in Flanders and in other parts of Europe.

Having explained my method of procuring and preserving the food of vegetables, I will proceed to state my practice in feeding or applying it. It is given, every spring, to such hoed crops as will do well upon coarse food, (my vegetable hogs and goats.) These are corn, potatoes, ruta baga, beans and cabbages. These consume the coarse particles of the manure, which would have been lost during the summer in the yard; while the plough, harrow and hoe eradicate the weeds which spring from the seeds it scatters. The finer parts of the food are preserved in the soil, to nourish the small grains which follow. The dung is spread upon the land as evenly as possible, and immediately turned under with the plough. It is thereby better distributed for the next crop, and becomes intimately mixed and incorporated with the soil by subsequent tillage. Thus, upon the data which I feel warranted in assuming, a farmer who keeps twenty horses and neat cattle, will obtain from his yards and stables, every spring, 200 loads of manure, besides what is made in summer, and the product of his hog-sty. With this he may manure annually ten or twelve acres of corn, potatoes, &c. and manure it well. And if a proper rotation of crops is adopted, he will be able to keep in good heart, and progressively to improve, sixty acres of tillage land, so that each field shall be manured once every four or five years on the return of the corn and potato crop.

From the New-York Farmer.

CULTIVATION OF TARES AND SWEDISH TURNIPS.—BY S. HAWES.

Mr. Fleet,—Having grown during the past season some tares and Swedish turnips, favorite crops with English farmers, I venture to send you some account of the culture and produce of both. About an acre of land in good condition, not having been recently cropped, was ploughed once, harrowed and then sown with three bushels of spring tares and half a bushel of oats on the 1st of May last. I had not the seed early enough, or the tares should have been sown by the middle of April.

They grew most vigorously, and by the end of June, were in flower, producing quite as much herbage as I ever saw them produce in England—indeed abundant; more than twice as much as any clover

I had growing at the same time. From the time they were in flower they were cut as wanted, and given to horses, cattle and pigs, all which ate them readily. Yet I did not think the stock did so well upon them as in England, possibly from the mode of their growth, which, either owing to the soil or climate, was different to what I had before seen. These went on growing freely after the pods were formed, though, commonly, when pods are formed, the whole strength of the plant is directed to perfect the seed, and the stalks soon cease to grow. They grew till the first week in September, when all were cut down, cured and stacked. The haulm or straw was abundant, and is excellent food for sheep. The seed a poor crop, as from half an acre I had only five bushels, which, even allowing for much waste by fowls whilst growing, was too little, as half an acre ought to produce at least fifteen bushels. I intend to sow an acre with them this spring, and hope they may yield better.

For Swedish turnips I had five acres of land, a good sandy loam, ploughed and harrowed repeatedly till clean, then manured with about twelve good two horse loads of half rotten manure per acre, which was ploughed in, and the turnips sown at different times, from the fifteenth of June to the 6th of July.

The seed was drilled on the flat surface twenty-two inches from row to row, and on the 6th of July we began to hoe out those drilled the 15th June. But those drilled on the 6th of July we began to hoe on the 20th, being only fourteen days from the time of sowing. In England I do not recollect any fit for the hoe in less than three weeks. But here vegetation is more rapid, both of turnips and weeds. In hoeing they were left about ten or twelve inches from plant to plant in the rows. They were hoed again in twelve or fourteen days, and afterwards a third time.

The plants soon covered the ground, the tops meeting, and the crop was an excellent one, equal to any I ever had in England. Part of the ground, which was low and not well drained, produced large turnips, but not so sound or sweet as those grown on high ground in the same field.

The whole were pulled early in November and thrown in heaps, then the tops were cut off and thrown to cattle, the turnips carted home and thrown into piles about six or seven feet wide at the bottom, and gradually coming to a point, which was about five feet from the ground. Mould a foot thick was thrown over them, leaving at every eight or ten feet a small hole to allow the warm moist vapor to escape, which always arises from the slight fermentation that takes place. No straw was used. The piles have been opened as wanted for use, closing the aperture with an old door and some litter for the time, and we have lost none. Fifteen or sixteen loads were put into an old ice-house for a few weeks, but the stock did not eat them so readily as those which came out of the piles. I doubt whether any cellar will keep roots so well or so sweet as earth alone. The crop was excellent, both in quantity and quality, but no account was kept, even of the number of loads, yet there must have been more than three thousand bushels. Cattle from the first were extremely fond of them; a lot of native wethers were a long time in learning to eat them, but at length did well upon them. My own Southdown ewes having been fed on them, had abundance of milk in January, and thus my early lambs will go to grass in good condition. Pigs, old and young, are fond of them, and they need no cooking. In England many store pigs are kept on scraps and bits of Swedish turnips left by cattle.

Of the expense I can give no account, nor have I much faith in such accounts generally. The preparation of the ground, and the sowing, were interrupted by repeated rains, so in pulling them up the men were repeatedly stopped by frosts, and had to get them secured as they best could. The culture of tares is nothing, but hoeing turnips is expensive, yet more and better food is yielded by turnips than by any other crop on this loam. On strong soils mangold wurtzel would be a better crop, as such soils seldom grow good turnips; but beets, to do well, should be sown in May, and are very liable to be hurt by early frost. Swedish turnips are not injured by even severe frosts, if used quickly after; but freezing and thawing will spoil them.

Yours respectfully,

Albany, March 11, 1834. S. HAWES.

Young Men's Department.

PLEASURES DERIVED FROM THE CONTEMPLATION OF NATURE.

Nature, with maternal kindness, offers to all her children the most delightful and universal, as well as the least expensive, of all pleasures. Such our first parents enjoyed in Paradise, and it is only depravity which leads men to delight in other recreations. Mankind are accustomed to despise the blessings they daily enjoy, and seek for amusements that afford them pleasure from their variety, and a succession of delight from their novelty: while the pleasures of nature exceed all others, are open to every one, and their enjoyment never leaves behind it the sting of remorse, or the tears of repentance. But we are so selfish as to disregard the charms of nature, because they are alike open to the eyes of the poor as to those of the rich; and so foolish as to despise them, because of their cheapness: whereas nothing should gratify us more than to know, the same objects which cause our delight constitute the happiness of millions. Compared with the noble and affecting pleasure such a consideration excites, how frivolous and deceitful are all those costly amusements and magnificent entertainments, which delight the rich and please the foolish! their enjoyment often ends with disgust, and leaves as its portion a painful vacancy of soul; whilst nature, ever rich and bountiful, continually varies her charms, and offers new beauties to the admiring observer.

All the pleasures which are the effects of art are of short duration, and fleeting as the dream, the illusions of which vanish when we awake. But the exercise of reason, and the ever-varying pleasures of the imagination, last forever, and derive new strength from contemplating the works of nature, which call forth all the finer feelings of the heart. To see the starry heavens, the earth variegated with flowers, a thousand different landscapes, and prospects vying with each other in beauty; and to listen to the evening song of the nightingale wafted on the breeze, whilst all nature is retiring to repose, will ever fill our souls with delight, and gratify all our feelings. If any one is insensible to these beauties, and unaffected by their charms, it must be owing to his depravity, or the stupidity which he has acquired from inattention. The great science of Christianity, consists in the innocent enjoyment of every good which surrounds us; and he who practises this, possesses the art of deriving the means of happiness from every circumstance that does not injure his virtue, his intellect, or his feelings. Beneficent Creator! thou art mindful of us in this beautiful season, and providest us with abundant sources of pleasure! Thou continually causest new springs of delight to open, and our hearts are filled with joy and gladness! If we desire to elevate our hearts to thee, to indulge in holy meditation, and to enjoy celestial bliss, nature often offers us the most ample means. May we ever prefer this exalted satisfaction before all the pleasures of sense! In these sweet days of spring, may the enjoyments of nature's purer pleasures be more grateful to us than the allurements of sensual gratifications, which neither dignify the mind nor purify the heart! Teach us, O Lord, to acknowledge thy divine power and goodness; for it is by seeking to know thee in the varied and numerous works of thy creation, that we open to ourselves a pure and inexhaustable source of delight, and are enabled to enjoy, in this state of existence, a foretaste of the felicity which the righteous shall experience in thy presence for ever and ever!—*Sturm.*

THE CULTIVATOR—JULY, 1834.

TO IMPROVE THE SOIL AND THE MIND.

The unprecedented cold weather which we experienced between the 12th and 15th May, seems to have extended its influence from the Mississippi to the Atlantic, and from Canada to the Potomac; and what is uncommon, the injury which it produced was less in cold and elevated situations than in those of warmer temperature. In the valley of the Hudson, fruit of most kinds has been destroyed; and if some districts have been more favored than others, it has been those where vegetation has been most backward, and in high situations. A few scattering pears, peaches, plums and cherries are seen upon the trees. Some apples that were late in coming into flower, and grapes that had been kept back, or had dormant buds, show indications of fruit. Fifteen miles west of this city, where vegetation is ordinarily ten days later than upon the river, the apple blossom was not sufficiently developed to be injured, and *there* is the promise of a good crop of apples. We presume this was also the case in Schoharie, Otsego, and in the counties to the north. Their apples and cider are likely to find a good market in the autumn. Not only the fruit, but the trees, seem to have been seriously injured, and in some cases destroyed, by the loss of their leaves. Their growth has since been languid and sickly, and we have noticed some

peaches and pears, and many grapes, the foliage of which was completely killed by the frosts, that have not yet pushed forth a new leaf, and which are apparently dead. Such were most advanced in growth, when cut down by the frost.

We perceive by the Ohio papers, that wheat and rye have been seriously injured in that state. Although these crops retained their green appearance, it was found, on splitting the stem, that the head of the grain, although enveloped by the sheath, was killed by the frosts. Some farmers were cutting down their grain for fodder, with the view of procuring a new growth from the roots, a method which is said to have been found to succeed, although the crop comes to maturity some weeks later than usual.

We do not pretend to assign a natural cause for this phenomenon in our seasons; but it is worthy of notice, that immediately after the cold spell which we annually experience in May or June, we hear of polar ices being met with in our latitude upon the coast; and in the present instance we have seen mention made of icebergs having been met with about the 12th or 15th May, as low as lat. 36, which, if correctly stated, is an occurrence, we believe, unprecedented. On the 8th May, 1802, snow fell at Pougkeepsie, and through the northern parts of the union generally, two to six inches in depth; the cold weather continued to near the first of June, and yet, from the uninterrupted fine weather, with occasional showers, which followed, garden vegetables were earlier at table that summer than usual. I saw squashes on the 28th June, and green corn on the 6th July. B.

COMPOSTS.

Much has been said and written in favor of compost manures; and under many circumstances they really afford a valuable accession to the fertilizing materials of a farm. But when the object to be obtained is not fully understood, they sometimes occasion a useless expenditure of labor. Composts are a mixture of animal dung, lime, ashes, vegetable matter, and earths,—two or more of them. The economy of composts consists in, first, saving the gaseous matter which escapes from manure while undergoing fermentation, and the liquids which flow from the dung-heap; and second, in rendering vegetable matter soluble, and food for plants, which was before inert and useless. Thus, if earth is mixed with and spread over a pile of dung while it is fermenting, it imbibes the volatile and liquid parts of the manure, which would otherwise be lost, and this becomes almost as fertihzing as the manure itself. This fact shows that manure loses much in fermenting, for it loses all the earth gains. If peaty or swamp earth is employed, a double object is gained; for while it prevents waste in the manure, it is of itself converted into manure, (being composed of vegetable matter,) by the process of fermentation. But when the object is merely to prevent waste in the dung, the process is most economically effected *in the soil*, where both the gases and liquids will be retained, and by which the transportation of the earth to and from the dung yard is saved. When the manure cannot be conveniently used upon *hoed crops*, before fermentation, then a bedding and covering of earth for the pile is matter of economy, and should not be omitted. So if it is desired to convert the vegetable deposite of swamps into manure, it may be readily and profitably done by alternating it in layers with hot dung. In this case one part of dung to three parts of swamp earth will suffice. A layer of dung, five or six feet broad, and as long as necessary, is first deposited on a proper piece of ground, then a layer of earth over it; and in this way alternate layers should be added until the pile is five or six feet high. As soon as the mass gets into a state of fermentation, which may be ascertained by plunging into it a stick for a few moments, and ascertaining thereby its heat, the compost is fit for use. This will require weeks or months, according to the temperature of the weather.

It will be perceived that composts in which no fermentation takes place, can be of little advantage. There is no volatile matter to be given off, and no tendency exists to break down and render soluble ligneous and woody matter. Lime operates more powerfully than dung in inducing fermentation in vegetable matter, though it is not prudent to use it in combination with stable dung: I have fouud by experience, that it causes a too violent action, and dissipates nearly all its fertilizing properties. Composts are particularly adapted to all the family of small grains, and for top-dressing grass grounds, where this latter practice is tolerated. Mere earthy matters add nothing to the compost pile; they merely prevent the waste of other materials which compose it. In making composts, therefore, for field use, earths should be preferred which abound in vegetable matter; and the litter, vegetable refuse, urine, soap suds, ashes, &c. should be added, which are ordinarily wasted, and which form annually a large aggregate upon a farm. B.

PROPER TIME FOR CUTTING GRAIN.

We find an interesting article upon this subject in the Farmers' Register, which details the result of the writer's observation and practice for twelve or fourteen years, on an extensive farm. The length of the communication, and our restricted limits necessarily limit us to a brief notice of this communication. The writer admits, that if we could be sure of good weather, it would be best to omit reaping till both grain and straw are ripe; but as this cannot be the case, and as the crop suffers and loses greatly if not cut and secured as soon as it is ripe, he is sure that a great saving will be found in reaping wheat *as early as the state of the grain will permit*. He considers that "wheat is fit for the scythe when the grain is in the *dough state*.—no matter how soft, provided it is clear of milk, or when no fluid comes out separate from the dough, when the grain is mashed between the fingers. But no one square yard of wheat can be found, in which all the heads have reached this state at one time; and, therefore, when not more than one-tenth part of the grains contain milk, I think it safe to begin to reap." "My green reaping when first commenced (in 1821) was fully *nine* days earlier than was usual—and it was pronounced then that I was destroying my crop, by reaping it so green. My practice is still condemned by many, who, however, have gradually, and perhaps unconsciously, advanced the commencement of their harvests, until they are not more than two or three days behind mine." The saving made in one season, by early reaping, when a long spell of rainy weather followed, which destroyed more than one-half of his neighbor's crops, was enough to pay for all the loss incurred by that plan in twenty years. The writer does not believe that any thing is lost either in the weight or bulk of grain cut in the dough state; and as to the quality of the grain for making flour, he believes it generally conceded, that the wheat reaped green is the best.

The truth of the foregoing remarks is corroborated by the opinions and practice of many of our best farmers. These observations apply equally to other small grains, particularly to rye. The great objection to the practice is, that the grain is not fit to be bound, as it should be to prevent waste and save it from rain, soon after it is cut. This objection is obviated by making small sheaves, and putting them in "stooks" of about six sheaves each, by setting the stubble ends of the sheaves far enough apart to give sufficient base, and letting the heads of all lean together so as to form a point.—These throw off a light rain, and will dry as they stand if made wet by heavy rain. When dry they may be put into shocks.

THE VINE.

"Observations on the character and culture of the European vine, during a residence of five years in the vine-growing districts of France, Italy and Switzerland, by S. T. Fisher,—to which is added, the manual of the Swiss Vigneron, as adopted and recommended by the agricultural societies of Geneva and Bern, by M. Brun Chappins, and the art of wine-making, by M. Bulos." The above is the title of a neat 12mo. volume which has been sent to us for examination.

It has become matter of serious doubt, whether the European vine can be successfully or profitably cultivated in the United States, for the purpose of making wine,—or even for table use, in this latitude, without the protection of walls or glass. It is subject to blight and mildew, and our September frosts are liable to overtake it, ere the fruit attains maturity. Mr. Fisher, however, thinks it may be acclimated, at least in Pennsylvania. The vine, he says, is not indigenous in Switzerland. It has been frequently found, he says, that the plants of foreign cuttings, though arrived at the proper age, and possessing a vigorous maturity, have refused to unfold a solitary flower. Cuttings from such plants have produced blossoms, which, however, proved abortive. "From the plants of succeeding cuttings other cuttings have been cultivated, following up the system for several seasons, till in the end a complete success has crowned the experiment; and it has been found that the process of acclimating the stranger plant has not reached its full accomplishment, until it has passed through four, and sometimes five generations of the vine."—p. 62.

To show that good wine does not always depend upon fertility of

the soil, but rather the reverse, we quote the author's remarks upon the vineyards of St. Julien, celebrated for the fine flavor and delicacy of their wines.

"The vineyards of St. Julien occupy the sides of the most barren rocks of that country, [Italy,] and I was at a loss to discover the necessary soil for the support of the plants. The vines were not more than six inches in height; of short stunted growth, and crowded together in a confused mass, without order, the space intervening being scarce sufficient to allow the weeding them. It is to the peculiarity of this stony *locale*, the reflected heat of the sun, and the absence of humidity from springs in the vine ground, that the delicate flavor of the wines of St. Julien is to be ascribed."—p. 78.

Mr. Fisher evidently took much pains to acquire such information in regard to the culture of the vine as might prove useful to his countrymen; and in this we think he has been successful: for if the foreign vine does not ultimately succeed with us, we have native varieties which, with the care bestowed by the European vigneron, will thrive, and produce as good wine as we ordinarily import. Mr. Fisher's book affords much needed information in regard to the culture of the grape, and the process of manufacturing it into wine. We recommend the work with confidence to such as stand in need of this information, as one of the best guides that has fallen under our observation. B.

Protecting Seed Corn from Birds, &c.—We record the following fact now, lest it may be forgotten at a more proper time, and as affording demonstrative proof, that tar will protect seed corn from crows and other birds.

In planting my corn, the seed was prepared as described in the second number of the Cultivator. Some days after planting, it was discovered that an entire row had been omitted. This was planted with untarred seed. On hoeing the crop, it was found that almost every spear of grain in this row had been pulled up by the birds, while not a hill of the tarred corn, on each side of it, had been touched. I do not employ *scare-crows*, or other expedients, to keep the birds from my fields. B.

Dairy Husbandry.—We have received an interesting letter from Ephraim Perkins, of South Trenton, upon this subject; and he has proffered a detailed statement of this branch of husbandry for publication in the Cultivator, which we respectfully solicit him to forward. The dairy district to which Mr. Perkins refers, consists of the second tier of towns lying north of and running parallel with the Mohawk river, in the counties of Herkimer and Oneida. Such has been the progress of the dairy business in that section of country, occasioned in a measure by the facilities of transportation offered by the canal, that the quantity of cheese sent to foreign markets, has increased, since the completion of the canals, from 70 to 1,300 tons; and a district, which was before nearly stationary in improvement and wealth, has advanced in nearly a like ratio in population and improvement. We should be pleased to receive from Mr. Perkins a detailed statement of the process of making the different sorts of cheese, and his estimate of the profits of the dairy business. Many of our counties upon the head waters of our streams are well adapted to the dairy and cattle husbandry, and will be thus profitably appropriated, as soon as the lumber has been got rid of. Lumbering and fishing are incompatible with good farming, and too often with good habits. Exclusive reliance upon the artificial products of the farm, begets a salutary competition, and leads rapidly to improvement and wealth.

Hay-Spreading Machine.—We have just seen in operation, at the farm of Gen. Van Rensselaer, a machine for spreading, stirring, and turning hay, invented and patented by Capt. Joab Centre, of Hudson, once of the ocean, but now of the land, and for some years an excellent practical farmer. The machine is of simple construction, is attached to a pair of wheels, and drawn by a horse. It seemed to do its work well, and promises to be a valuable acquisition, in saving labor, and in facilitating the curing of hay. The machine may be seen in operation during the haying season, at General Van Rensselaer's farm, and at the Captain's farm, near Hudson.

We shall hereafter be more particular in noticing this machine, and in describing other new farm implements which have fallen under our notice, calculated to facilitate the labors of the farm.

CORRESPONDENCE.

Buffalo, May 26, 1834.

My Dear Sir—I have for a long time intended writing you on more subjects than one, connected with our State Agricultural Society, the establishment of an agricultural institute, &c. &c. but my engagements have been so continual and pressing for the last six months, that I have had far too little time to spare on the subject so near my mind as the improvement of our state agriculture. I did indeed hope, after reading with much pleasure Governor Marcy's sentiments on the establishment of a permanent institution for the improvement of our farmers, that some decisive measures would be taken by both branches of the legislature, to place the subject in a right view, and to act upon it; but I confess to you my utter disappointment, on reading the reports of the committees to whom the subject was referred. But we must not despair. Another effort may be attended with success; and if so, much of it will result from *your* own long and continued efforts to attain it.

I observe by the published proceedings of the State Agricultural Society in February last, that they have chosen me one of its vice-presidents, an honor to which I have little claim, and am indebted vastly more to the kind feelings and confidence of my friends in the society than to any merit of my own. My agricultural *experience* has been as yet limited, although my observation has been constant and somewhat varied; and if I can in any way render my humble mite of service to the cause of the farmers, I shall be happy. I fear our influential men, and those of capital and large landed estates, take too little interest in the subject. In order to set the minds of the great body of our husbandmen upon inquiry, the subject must be brought home to every farmer of influence and observation. Example is every thing, and unless those who lead will take a strong and vigorous hold, I fear little will be done in this very necessary work.

I have received a few numbers of "The Cultivator," which pleased me much. It cannot be too highly recommended, and it is got up in a form and at a price so perfectly unobjectionable, and withal so useful and appropriate to the common farmer, and indeed to every one who cultivates even a garden, that it should readily commend itself to the attention of all. I enclose you five dollars to pay my arrears as a member of the State Agricultural Society, and for a copy of the Cultivator, which please to order directed to me from the commencement. I truly feel ashamed that I have not sooner ordered it, and taken a deeper interest than I have done to procure it subscribers and circulation: but I have only to plead as before my extreme confinement to business. I hope hereafter to have more leisure to attend to those matters, which, though apparently trifling in themselves, yet may, and do often lead to important results.

I have spent a considerable share of the past winter and spring on Grand Island, which you will probably recollect, a few gentlemen of Boston and myself purchased last fall. I have been busily employed with a large number of men in erecting a steam saw-mill to cut up the immense quantity of valuable white oaks which grow there, for the eastern market, for which they will afford many years supply. We have built up a snug little *log* city on the eastern shore, which we call Whitehaven. It stands on a pretty bluff immediately on the bank of the Niagara, a bold, sweeping, clear stream, and directly opposite the Erie canal. We have also got out, and they are now about being shipped by the canal, the frames and timbers of three large merchant ships, to go to Boston, there to be put up and finished. Thus you see that the oaks of our western forests, which were a few years since consumed as a worthless incumbrance on our soil, are now an article of export more valuable than the soil on which they grow. We have on the island about 16,000 acres, nearly the whole of it, and I think the finest body of land lying together that I have seen in the state.

We are clearing up and getting under cultivation a large, and what will be in a few years, a very fine farm. It lies upon the river where it makes out in a large bay, and within sight of the villages of Black Rock and Waterloo. Here we are laying down a considerable quantity of meadow by stocking with oats, peas, wheat, barley, &c. Our lands here are very strong, and will retain the grasses sowed upon them and turn off heavy crops for many years without ploughing. I spend as much of my time as possible at the farm, (and I confess to you by far the pleasantest portion of it,) in setting the fruit trees, regulating the fences, looking at my cattle and pigs. I

have three beautiful Devon cows and a bull, all full bred, and a fine calf; also a Holderness heifer and calf, good ones too; and a splendid bull of the "improved short horns." When I first obtained him last fall, our own folks and others who saw him did not see much to admire in the animal, although "he came all the way from Boston," and generally preferred the Devon, who I had of our friend Bement in Albany. But their prejudices to the Durham short horns are now removed, for he has wonderfully improved in his appearance, and is considered the finest animal they ever saw. I have had my doubts, and so have expressed them, whether for *our* country the Durhams were superior for general use to the Devons; but I must say that further observation continually convinces me that for *all* the purposes of the farmer, *taken together*, the Durhams bear the palm. Yet the Devons are a beautiful, hardy and good race of cattle, of the best possible colour, and much superior to the common stock of the country. I intend, as soon as practicable, to obtain a full bred cow or two of the "short horns," and get as rapidly into the stock as possible. With a number of the native cows now on hand we shall soon have a tolerable stock of half bloods.

When in Albany last fall, I bought a fine pair of spotted China hogs of Mr. Bement. The female soon after brought me a beautiful litter of pigs, crossed with a long bodied white English breed, which Dr. Hosack sent Mr. B. from his farm at Hyde-Park. I think it the finest cross I ever saw. I gave away three of the male pigs to my friends in distant parts of the country; three females I keep, and two barrows I am fatting in a pen to see what they will amount to. They are the most perfect animals of the hog kind I ever saw. They are continually fat and live on absolutely *almost nothing*. They have lived all the spring in a wild pasture, and have not been up to feed for a fortnight past, while a few of the real *woods breed*, which I bought of the former occupant of the farm, eat all the slops and butter-milk of the house, and actually appear to grow poorer with their keeping. It is surprising that people will pay so little attention to the breed of their hogs and cattle, when such different results are constantly before them.

In clearing up the lands I often have little clumps, and occasionally single trees left, where they grow thrifty and of a good kind, as shag-bark hickory, black-walnut, white-oak, sugar-maple, &c.—They soon grow up to beautiful shades, adding value to the soil and beauty to the landscape. It would indeed give me much pleasure to have you occasionally at my elbow to aid me with your valuable advice in all these matters. A little attention to things of general utility in the beginning, such as the proper selection of shade and timber trees, in proper locations on the farm often saves great expense and waste of time in after years.

But I must close, having written much more than I expected when I sat down. Rest assured, my dear sir, you have my best wishes in the useful employment you have so liberally undertaken, of disseminating and conducting this journal; and if my time and opportunity will hereafter permit me to drop you any thing acceptable for your paper, I shall take a pleasure in doing it.

Very truly, and respectfully yours,

J. Buel, Esq. L. F. ALLEN.

Burlington, June 17th, 1834.

Sir,—Among the spurs of the Green Mountains, and elsewhere in Vermont, there exist extensive deposites of land or fresh water shells. They occur in beds of several feet thickness, generally two or three feet below the surface, and often partially covered by small ponds. A great proportion of the mass is reduced to an impalpable powder; and the few shells, whose forms are discernable, are very small, and completely friable. They are generally free from any admixture of earth, or other foreign substance, and of a very white colour. They have been sometimes burned for lime, but have not, to my knowledge, been used for agricultural purposes.

These deposites constitute, I suppose, what agriculturists call *shell marl*, and the object of this communication is, to ask you to give your Vermont subscribers, through the Cultivator, some information, respecting,

1. The *value* of this substance as a manure.
2. The *mode* and *time* of its application.
3. The *sort of soil* to which it is best adapted.
4. The *quantity to the acre.*
5. Whether it should be used *by itself, or with stable manure.*
6. And whether its valuable properties would be increased by *burning it to lime*, or whether on the contrary, any increase of its activity by burning, would not be counterbalanced by the *destruction of such animal matter* as may exist in the mass. S. X.

J. Buel, Esq. *Editor of the Cultivator.*

REMARKS.

We have had no practical experience in the use of shell marl, but have employed argillaceous or clay marl in husbandry, with manifest advantage. Both kinds, we believe, are similar in their effects: both are valuable on account of the calcareous matter, or carbonate of lime, which they contain; and they are deemed rich in proportion as this is found to abound. Marls benefit chiefly by their mechanical operation in the soil, rendering clays more porous, and sands more compact and retentive of moisture. They are analagous in their operation to chalk or powdered limestone. They do not, like quick-lime, accelerate the decomposition of vegetable or animal matter; yet they tend to correct sour soils, abounding in sorrel, and to bring in white clover in its stead. From these considerations it will be perceived, that shell marl is best adapted to improve stiff soils, and clay marl to improve sand soils; and that in both cases, these benefits will be permanent. We suspect our correspondent is mistaken in his supposition, that these shells are free from any admixture of earths, (other than calcareous) a fact which can best be determined be analysis. This analysis may be readily obtained at Burlington, from whence our correspondent dates; and it is also necessary to determine the value of the marl. In the mean time we proceed to answer our correspondent's queries in the order which they present:

1. The value of marl is in proportion to the quantity of carbonate of lime which it contains, and the distance to which it has to be transported for use. This proportion is sometimes 80 or 90 per cent, and should amount to at least 50. If it abounds in animal matter, as is suggested, its value is enhanced.

2. Marl is best applied in summer, because it is then dry, light, and most easily reduced to powder; though it may be advantageously spread during the winter frosts. It should be completely incorporated with the soil. Hence it should be evenly spread, and ploughed and harrowed in; and its benefits are developed in proportion as its admixture with the soil becomes perfect.

3. Marl benefits most soils—but most those which are either too porous or too compact for tillage crops.

4. From 200 to 800 bushels of marl are applied to the acre;—the common quantity 250 bushels. There should be at least a thin coat over the whole surface.

5. Marl may be used with or without stable manure, as neither has any injurious action upon the other.

6. *Marl* is not benefitted by calcination or burning. When burnt, shells become quick-lime; and if they abound in animal or vegetable matters, these are destroyed by fire, without any diminution of earthy matters. B.

Mr. Buel,—I have this year commenced farming on a small scale, and think of turning my attention principally to grazing and dairying; hence I am anxious to see something from practical dairymen, on the best mode of keeping cows, making and preserving butter and cheese, the quantity of salt to the pound of butter,—and whether loaf sugar or sal nitre, or both, may be used to advantage in preserving butter. M. BARKER.

Borodino, June 17.

☞We solicit answers to the above questions from some of our practical dairymen and graziers.

J. Buel,—I am glad to see the correspondents of the Cultivator alive to the subject of destroying the Canada thistle, as it is high time that something is done to arrest their progress, particularly in the western districts of our state. And seeing a communication in your last number requesting practical knowledge on any subject that may interest the farming community, I felt willing to throw in my mite, though with diffidence, on this all important subject. We last year had a strip extending quite through a field, where we intended to sow barley, which we did not sow; but as the thistles appeared, turned them under with a plough pretty deep at first, and in the course of the summer ploughed the piece seven times, and harrowed as many more, which has effectually destroyed them, there being now not one to be seen. After the three first ploughings they sprung up very soon; after that, they began to appear sickly, and of a yellowish cast, and after the fifth ploughing they appeared no more. This year we are managing thirty acres in the same way, and several of our neighbors, seeing the beneficial effects of the experi-

ment, are now pursuing the same method. Planting the piece with corn the first year, if it be sod, I think preferable, as that subdues the sod, which otherwise would be much in the way of early cross ploughing.

Some have contended that much ploughing hurts the land: but experience has confirmed me in the opinion that it is very beneficial to it: first, because it kills every thing foul in it, and secondly, by the act of pulverization, renders the soil light and loose, and by that means pervious to heat and water. We have wheat now growing on the piece, which is beginning to tumble down, and my greatest fear is, that it will be too large to fill well, and no manure put on it, while the wheat adjoining is not equal to it, though heavily coated with stable manure.

I perfectly agree with *A Subscriber*, in your last number, that keep down the top of any plant one summer, and it will effectually destroy it. Such being the fact gained by experience, (the best school extant,) I think a knowledge of it ought to be more generally diffused.

Skaneateles, Onondaga co. N. Y. 5th mo. 18th, 1834. G. W

Homer, June, 5th 1834.

SIR,—I have observed several communications in the Cultivator on the destruction of the Canada thistle, all of which are stated to be the result of actual experience, and founded on good reasons. What I am about to communicate has not been tested thoroughly, but the experiment has been tried two or three times, and the discovery was wholly accidental and in the following way. Some four or five years since, our farmers got into a rage for raising hemp, and appropriated their richest soil to it. A farmer in this town took a piece of land, covered literally with the Canada thistle; he took this ground because it was less worn and more rich than any he had on the farm; he sowed the hemp quite thick, but was fearful that the thistle would injure the crop; but on examination, after the crop had sprung up some six to eight inches, he found the thistle to turn yellow, and as the hemp advanced, he saw that the thistle wholly disappeared where the hemp was thickest, and where it was more thin, there were a few sickly stinted plants of the thistles standing, which were easily pulled up by the hand, bringing the root for some depth; and after the crop of hemp, to this time, (about four years,) he has had no thistles there. He communicated this experience to a gentleman near this village who was much troubled with the thistle, and he tried it two years since with the same effect, and has no doubt of its being an effectual remedy. He observes that the land should be made rich by manures, and the hemp sown quite thick, so as to effectually choak the thistle and draw from it all moisture or nutriment. These men had tried all other ways recommended in the Cultivator; but think hemp the surest and most profitable remedy which can be tried, without any loss of labor or crop. For one, I am desirous of seeing the experiment tested, and hope that through the medium of your Cultivator I shall hear the result of several experiments. It is too late to make one this season; therefore, because men are forgetful, it will be well to mention it the ensuing spring. I have great confidence in it, but I may be wrong; at any rate, the trial of the remedy proposed is unlike many new things, if it does no good it will do no injury.

There are two things which will particularly suggest themselves in this experiment, viz: 1st. Whether the plant is destroyed by the hemp taking up all the nourishment from the root? or, 2d. Whether the plant is in effect smothered by the surrounding herbage? From the two experiments of which I have spoken, I am of the opinion that the greatest injury the plant receives is from the latter. I have ineffectually tried to root up the thistle, and instead of diminishing them in that way, they have increased; but by cutting the tops close by the ground, or pulling them, I have in a measure succeeded, leaving the root undisturbed; but I do not doubt that constant ploughing will destroy them; they must have atmospheric nourishment or die, and in this way hemp destroys them. It, I think, wholly cuts off atmospheric nourishment, or allows it to be communicated in so exhausted and unhealthy a state, that the thistle dies by exhaust on.

Yours, &c. A SUBSCRIBER.

A Plough Farmer, whose communication we cannot now insert entire states, that he completely eradicated the Canada thistle upon two acres, where they were very thick, by sowing clover upon it: the clover got the start in the spring, grew luxuriant, and smothered the monsters. He proposes a premium for the best method of extirpating quack grass.

Tillage Husbandry.

West-Springfield, June 11th, 1834.

J. BUEL, Esq.—As an earnest friend of the agricultural interest of the community, permit me to recommend to your notice, the publication Mr. Wm. Clark Jr. of Northampton, in the 10th Vol., No. 38, of the New-England Farmer, as well as your own observations on it, in No. 40 of the same volume. If you view them in the same favorable light, as well as consequence to the public, in which I did, and many others also in this vicinity, could you do a more acceptable service to the public, than by inserting them in your excellent Cultivator? and to have any effect this seasan, they ought to be put in the number for July or August. Mr. Clark, I learn, is an enlightened, practical agriculturist. If he is correct in his statements, his observations cannot be too widely extended.

I am, sir, with respect and esteem, your ob't servant,

JUSTIN ELY.

CUTTING CORN STALKS.

Mr. FESSENDEN,—I have made a small experiment the past season, to ascertain the damage, if any, that results to the corn crop, from topping the stalks in the usual way. And influenced by the request of several individuals, and the thought that, perhaps it might *lead* to a better knowledge of this important branch of agriculture, (the growing of corn,) I am induced to forward the particulars to you for publication. Although I am aware that *guessing* enters largely, and perhaps necessarily, into the calculation and business, of the farmer, I am also aware that experiment cannot be conducted with too much precision; indeed that experiment to be relied on, must be conducted entirely without guessing Therefore, I have been somewhat particular in conducting this. And lest some of your readers may be a little sceptical in regard to the result, and perhaps unwilling to allow that the course which has been pursued by our ancestors, from time immemorial, is not the best course, I will give the details; and if an apology be deemed necessary, for being so very minute, I can merely say, that as the experiment seems to me so deeply to involve the interests of corn growers, it may be well to give a detailed statement of the case, so that any interested may be able to draw their own inferences. And if, in your opinion, it is worthy a place in your useful Journal, or likely to promote the interest of New-England farmers, you are at liberty to publish all, or a part, as you shall think best.

For a few years past, I have not cut my corn stalks until the corn was harvested, *guessing* that it was a course preferable to the one commonly pursued in this part of the country, of topping the stalks while in a green state. But for the purpose of settling this point more clearly, and with as little trouble as the case would admit, I selected, about the 5th of September, a row of corn in a field of about five acres, intending to take one that would average in quality equal to the field throughout, that I might at the same time be able to ascertain with tolerable certainty, the product of the whole field. The manure having been spread on the surface of the ground and harrowed in lengthwise of the furrows, and the corn planted across the furrows, made it apparently less difficult to select an average row. On this row I cut the stalks from half the hills; beginning at one end and cutting the first hill, then leaving the next uncut, and so proceeding alternately, cutting one and leaving the next uncut, through the row. I had intended to confine the experiment to this row, but finally was led to extend it so far as to include four rows, and numbering them agreeably to the order in which they were standing tn the field, this row may be called No. 2. There were ninety-two hills in the row, and the stalks were cut from forty-six hills, all of them in the manner that is here termed jointing (i. e.) cut off between the ear and the first joint above the ear. I thought they were somewhat more ripe than is usual at the time of cutting; a few of them were nearly dry. The soil was a sandy or gravelly loam, anciently covered with pine, oak and chesnut. In hoeing the corn no hills were made, but some care was taken that the surface of the ground should remain as level as possible, through the season.

My estimate of the number of hills on an acre, was made in the following manner, and if I am wrong in my calculations, I shall be corrected by some of your readers.

In an area of 200 feet square, (or 40,000 square feet,) there were sixty-two rows, with fifty-four hills in a row, making 3,348 hills. This is equal to 3,646 hills per acre, each hill occupying nearly twelve square feet of surface. There were about four stalks of corn in a

hill. In estimating bushels, I have allowed the lawful weight of fifty-six pounds to the bushel.

At the time of harvesting, the corn was husked in the field. The forty-six hills from which the stalks had been cut, gave forty-eight and a half pounds of ears: and the forty-six hills on which the stalks had not been cut, gave sixty-two pounds of ears. The number of ears in the two cases was about the same; those from the uncut hills were evidently the best filled out and the most hale; on a large proportion of them the kernels were so closely wedged in, as to make it difficult to bend the ear at all without breaking it. There was very little mouldy corn in either case, a few ears were gathered, mostly from the cut stalks, but the whole quantity was so small as to make it questionable whether cutting the stalks had much effect in this particular.

Both parcels were carefully laid aside in a dry chamber for about six or eight weeks, at the expiration of which time they were again weighed, and the parcel of ears from the uncut hills had lost in drying about two per cent more than the other; affording some evidence that the sap continued to circulate for a greater length of time, in the uncut than in the cut stalks. The uncut hills, gave 42 lbs. 8 oz. dry shelled corn, equal to 14 oz. 12⅓ grs. per hill, or 60 bushels and 8 pounds per acre. The parcel from the cut hills gave 33 lbs. 7 oz. equal to 11 oz. 10 grs. per hill, or 47 bushels and 18 pounds per acre; making a loss of 12 bushels and 46 pounds per acre, by cutting the stalks. Conclusive evidence, that while the sap is in circulation, nature does not assign the stalks an unprofitable office. The product of this whole row, taken together, cut and uncut hills, was equal to 53 bushels and 41 pounds per acre.

The product of row No. 3, taken by itself, (containing ninety-two hills, on one-half of which the stalks were cut on the same day the others were,) would not show the practice of cutting stalks quite so destructive in its effects, as that exhibited in row No. 2, its whole produce was 77 lbs. 9 oz. dry corn, equal to 55 bushels and 10 pounds per acre, or 1 bushel and 25 pounds per acre more than row No. 2.

Not satisfied with resting the experiment here, I gathered the corn on rows Nos. 1 and 4, (i. e.) the rows each side, next adjoining No. 2 and 3, and on which none of the stalks had been cut. These rows, taken together, contained 186 hills, and their product of dry shelled corn was 171 lbs. 13 oz. equal to 14 oz. 12⅓ grs. per hill, or 60 bushels and 8 pounds per acre, precisely the same average yield as that part of row No. 2, on which the stalks had not been cut; this *exact* coincidence, however, I think may be numbered among those cases which rarely happen.

The difference between the two rows on which half the stalks were cut, and the two rows on which none of the stalks were cut, was 5 bushels 38½ pounds per acre. If this difference arose from cutting half the stalks, (and I know of no other reason,) then cutting the whole, would have reduced the crop 11 bushels and 21 pounds per acre, or from 60 bushels and 8 pounds to 48 bushels and 43 pounds per acre.

To recapitulate, row No. 2, on which the experiment was commenced, taken by itself is as follows, viz: 46 hills on which the stalks had *not* been cut, gave 42 lbs. 8 oz. dry shelled corn, equal to, per acre,..... 60 bush. 8 lbs.
46 hills from which the stalks *had* been cut, gave 33 lbs. 7 oz. dry shelled corn, equal to, per acre,.... 47 " 18 "

Loss by cutting the stalks, per acre,..... 12 bu. 46 lbs.

The four rows taken together, stand as follows:
Nos. 1 and 4, on which no stalks were cut, gave an average of, per acre,..... 60 bu. 8 lbs.
No. 2 and 3, from which half the stalks were cut, gave an average of, per acre,..... 54 " 25½ "

Loss by cutting one-half the stalks per acre, ... 5 " 38½ "
2

On cutting all the stalks, would make a loss equal to, per acre,..... 11 bu. 21 lbs.

The difference in the result of the two cases, is 1 bushel and 25 pounds per acre; or, in the two experiments, (if it may be so termed,) there is an average loss by cutting the stalks, of 12 bushels 5½ pounds per acre; a loss quite equal to all the expense of hoeing and harvesting, especially when we consider that in hoeing, the labor of making hills was dispensed with.

If I had cut all the stalks, and obtained a crop of forty-eight bushels to the acre, the very fact of having forty-eight bushels, would, I think, be considered by farmers generally, in this section of the country, as proof positive that the stalks were cut without injury to the crop. Or if I had gone one step farther and made large hills, at an additional expense of one dollar per acre, and thereby reduced the crop to forty-five bushels per acre, the forty-five bushels would be considered sufficient proof, that making hills (which, by the way, are usually made equally large and high on wet or dry land, without regard to soil or situation,) was labor well laid out. For although you occasionally give us a *large corn story*, swollen a little, perhaps, by *guessing* it off in *baskets;* yet, judging from what we see and know about raising corn, we call forty-five bushels per acre, a good crop.

A measured bushel, from the cut hills, weighed 57 lbs. 6 oz.—one pound less than from the *uncut;* the shrinkage being very near equal to the whole loss in weight.

If this experiment is a fair test, it seems *that about twenty per cent, or one fifth part of the crop is destroyed, by cutting the stalks in the way they are usually cut.* If further experiment should establish this fact, I think there are few farmers that will hesitate long in deciding which is the most valuable, one acre of corn or five acres of top stalks. But this twenty per cent is not saved at the expense of losing the stalks; they are worth as much, and I think more, all things considered, after the corn is harvested, than they are, gathered in the usual way. If, after being bunched up in in a green state, they heat or become mouldy, (a case of frequent occurrence,) they are utterly worthless, except it be for manure; I know of no animal that will eat them. But after they have once been dried by the frost and wind, a subsequent moderate degree of mouldiness seems to be no injury.

The course which I have pursued with them, and for the present I know of no better, has been as follows:—In the first place, they are cut off near the ground, and for this purpose a short scythe is found the most convenient instrument. The expense of cutting in this manner, however, is but a mere trifle, if any, more than cutting the stub stalks in the spring, and may with propriety be entered as an item of expense against the next crop, for which it is preparing the ground. After cutting, they are gathered into bunches of suitable size for binding, and three good sheaves of rye straw, if wet, will be sufficient to bind a ton. In gathering them up and laying in bunches, an active boy will do as much as a man. In this way, the whole expense of gathering, binding and loading, will not exceed 75 cents per ton. As they are very bulky, for want of barn-room, I have them stacked near the barn-yard; and I think I may safely say, that my cattle eat more pounds of stalks from an acre gathered in this way, than they would from the same acre, if gathered in the usual way. It may be objected to this, that they are not as good and nourishing as others; as to that matter, I am not able to say; but if the cattle are good judges in the case, (and I think they ought to be admitted as such,) they are quite as good and quite as nourishing, for they are eaten apparently with quite as good a relish. In addition to this, they are obtained without breaking off ears or breaking down hills in hauling out, occurrences quite frequent in the other case. They also furnish more than double the quantity of bedding for the yard, an item of no small moment in the list of "creature comforts," during our cold winters. And last, though not least, they make more than double the quantity of manure, the value of which will be duly appreciated by every good farmer, without argument. It may be said that the butt stalks can be gathered after harvest, and furnish the same quantity of litter and manure as in this case; that is true; but the expense of gathering both parts in that way, from the butts being so short and inconvenient to bind, would be three times as much as it is to gather them whole. Thus viewing the subject in various points, I think this method of managing corn stalks is much better than the old one; and that a little observation and experience will convince the most sceptical, that this branch of agriculture is not yet brought to a state of perfection; that there is yet room for improvement.

In passing through a field of corn, about the first of September, I noticed that my clothes contracted a strong smell of smut, and not being aware that I had come in contact with any smutty ears, I was led to examine a little to ascertain the cause. I found many of the corn leaves nearly covered with rust, (something similar to that observed on the stalks of English grain, preceding a blight,) and intermingled with the rust, was an abundance of very minute blisters of

smut, or something which had the appearance and smell of smut. As I had never observed any thing of the kind before, and smut is said to be injurious to cattle, I have thought that something of this nature might have occasioned the difference of opinion entertained by some of your correspondents, last fall, in regard to the utility of feeding milch cows with green corn stalks. Feeding cows with smutty stalks, even if "fed to the full," would probably tend to dry them up; while feeding them plentifully with healthy stalks in a green state, would undoubtedly increase their milk.

In conclusion, I would inquire, if you can (through the columns of the Farmer,) give us the detail or result of any experiment made to ascertain the damage sustained by pasturing or feeding English grain on mowing land. I think this an important subject of inquiry to every New-England farmer, and submit it for the purpose of obtaining information. That good crops are sometimes gathered after feeding, is well known; but facts are wanted, which will fairly exhibit the effect of feeding those lands. Although this practice is handed down to us with the claims of ancient usage for its support, and perhaps might have been expedient in former days, yet, from some years' observation, I have little doubt that accurate experiment, particularly with English grain and young clover, will prove it to be a species of farming similar to that of topping corn stalks, and equally disastrous in its effects. WM. CLARK, Jr.

Northampton, March, 1832.

Mr. FESSENDEN—I was highly gratified with the perusal of the leading article in your 38th number, from the pen of Mr. Clark, on cutting corn stalks. Experiments like those he has detailed, are of great value to the farming interest, and richly entitle those who make and publish them, to the appellation of public benefactors. I beg leave to suggest the cause of the difference in the product which resulted from Mr. Clark's experiments.

There is a striking analogy between the animal and vegetable kingdoms. Food taken into the stomach of animals does not nourish but is prejudicial to health, unless it undergoes the process of digestion. Nor does food nourish the plant until it has been elaborated by the leaves. Plants, therefore, without leaves cannot grow; but, on the contrary, if defoliated in hot weather, the unelaborated sap becomes stagnant, ferments and destroys the vitality of the plant. Thus when the tops of corn are cut, the supply of food to all the ears *above* the remaining leaves, is cut off, and the supply is materially diminished to those below. A diminished product must of course be the consequence.

I very much regret that Mr. Clark did not carry his experiments one step further, and ascertain the relative weight of forty-six hills cut with the entire stalks at the time he topped his No. 2. It would have decided whether the stalks afford nutriment to the grain after they are separated from the roots, and tow hat extent. This last has been my method of harvesting my crop, from an impression that I lost by it nothing in the weight of the grain, while I gained much in the quantity and quality of the fodder. The objection that the stalks mould is not tenable. They will not mould while the corn is upon them, if tied above the ears. And if not sufficiently dry when the corn is picked, they may be left in stacks till perfectly cured; and yet be housed in far better condition than they are by the ordinary mode of saving them. It is not the drying that deteriorates their value for fodder, but the *drenchings* which they get when left out till the corn is picked, and the frosts, which diminish very much their nutritive properties. If well cured, and especially if cut and steamed, cattle eat them freely, and I consider them no wise inferior to hay. The grain from the crop secured in my way, has weighed sixty and sixty-two pounds the bushel. It is a twelve rowed early variety, which I denominate the Dutton corn.

I have remarked, that the modes of planting corn, or rather the distance between the plants, is different in different states. In New-England, the distance is greater than in New-York, and greater in Pennsylvania than in the former. Mr. Clark's hills were four by three feet, which gave him 3,646 hills, or by my estimate 3,630 on the acre. Our Mr. Stimson plants at two and a half feet each way, and gets upon the acre 6,969 hills, or nearly double what Mr. Clark does. I once planted an acre in drills, two rows in a drill, the plants six inches apart in the rows, the rows six inches apart, and three feet between the centres of the drills, quincunx, and had, if there were no vacancies, 30,970 stalks, equal to 7,742 hills on the acre. The ground and entire product were accurately measured and weighed. While the Messrs. Pratts, of Madison, produced 170 bushels on the acre, by planting in drills, three rows in each, quincunx, thus, ⁚ · ⁚ · and four feet from the centre of the drills. If the rows were six inches apart, and the plants nine inches in the rows, the plants amounted to 43,560, equal to 10,890 hills. Assuming as data, that in all the above cited cases each plant produced an ear of corn and that the ears averaged one gill of shelled grain, their product would be as follows, in bushels and quarts:

Mr. Clark's,	56	bushels,	13	quarts,
Mr. Stimson's,	108	"	24	"
My own,	120	"	31	"
Messrs Pratts',	170	"		

The close planting, whether in hills or drills, requires high manuring, and the two and three rowed drills, extra labor; and the ears may withal be somewhat smaller. Yet I nevertheless believe that seventy or eighty bushels may be obtained on an acre, with good manuring on a genial soil, in our mode of planting, with about as little labor as twenty, thirty or forty bushels, are obtained in the New-England or Pennsylvania open method.

I have detailed the preceding facts and calculations, not with a view to vaunt of our skill or of the fertility of our soil, but to *show how* the large crops of corn have been raised in this state, which have been noticed in the papers.

There is one fact connected with the experiment of the Messrs. Pratts, worthy of consideration; there was not a plant missing, or deficient, in their field. They quadrupled their seed: and pulled up, as the character of the plants was developed, all but the requisite number, reserving the strongest and most promising. It is common to see corn-fields very deficient in plants and even in entire hills. This deficiency often amounts to one-fourth or one-half.—The loss incident to this defect may readily be estimated, and greatly counterbalances the expense of extra seed, and the labor of thinning the plants. J. B.

Albany, N. Y. April 9, 1832.

THE CULTIVATOR, OR HORSE HOE.

This is an instrument not as much known and used as it deserves and ought to be. It is adapted for operations between the plough and harrow, and at certain times is much better than either. It is half a plough, half harrow and half hoe, and does all these operations conjointly. The first process, after corn has come up and is three or four inches high, is to use the common harrow upon it. This breaks the ground and partially clears it of the weeds or grass. It is soon performed, and is very useful to the young plant. The next step has been to pass the plough twice through each furrow, throwing the ground from the corn to the centre of the furrow. Now this is the time to use the cultivator. It ought, after a few days, to follow the harrow, and is much more useful than the plough as well as a great saving of labor, because it is necessary to go only once between the rows of corn. It cuts as deep as the corn plough and pulverizes the soil much better. It tears up and brings to the surface the roots of grass which the plough only covers, and by adapting the width of the cultivator to the space between the rows of corn, it half hoes the corn at the same time, and does the whole work most admirably. When there is much grass growing with the corn, it is an extremely useful instrument, as it pulls it up by the roots and in a great measure destroys it. For the Fiorin or Quack roots, with which our soil too much abounds, it will be of great service, and it appears to me it will be the most effectual remedy for it of any instrument we have yet tried. Corn is much sooner dressed with the hand hoe, by the half ploughing, half hoeing operation of the cultivator, when it has preceded it. The cultivator is likewise very useful for the raising of potatoes, and for ploughing between the rows of turnips, and where a clover lay has been turned over to put down to wheat, when the plough cannot be again resorted to for fear of disturbing the sod—this instrument may be used for a shallow ploughing, which it will do much better than can, by any other mode, be effected.—Corn is now raised with much less labor than formerly. It was the custom to hand hoe a crop two and often three times, and this was always an expensive and tedious process. Hoeing is now often omitted entirely, and is seldom done more than once: and still there are heavier crops of corn raised now than formerly. The process of high hilling is not only not necessary, but in a measure injurious, and our premium crops of corn have been raised with little hoeing, and of course at the least expense. The idea that corn well grown will blow over by the high winds without the ground is well raised at the foot of each hill, is erroneous. Providence has given to every

plant sufficient roots and strengh of stem to secure it against accidents of this kind, and we may aid the extension and multiplication of the roots best, and thus add to its security, if necessary, by stirring the ground, which will enable the roots to penetrate it readily in every direction. High hilling to potatoes is possitively injurious. It not only turns away the rains from the plant, but by raising a mound around them, prevents the sun and air from having that influence in aiding their growth and bearing, which are both essential to the insurance of a good crop.—*Columbia Sentinel.* A.

From a communication in the Farmers' Register.

DIRECTIONS FOR BUILDING WHEAT OR OTHER GRAIN SHOCKS.

The foundation is begun with three or four sheaves set up so as to form a little cone—that is, the buts on the ground set out so as to make a base broad enough for them to stand when the heads are brought together, (as they should be,) to a point. Other sheaves are set up in the breaks of the first, placed firmly on the earth, and the heads inclined to the central point. This brings the base to a small circle, and the heap to a conical form. The builder (and there should be only one to a shock, to secure good and equal work,) now continues to add to this, by placing other sheaves on the ground and against the breaks between the preceding coarse, and thus going round the circular heap, until the foundation is large enough. The but of every sheaf should be well pressed to the earth, when placed, and its top pressed to the central point, with increased force, as the size of the heap will bear the pressure without danger of its being moved. When the foundation is finished, instead of being flat topped, it rises to a central point, and its whole profile is somewhat in the shape of the old fashioned Dutch or "hipped" roofs of houses—the sides of the sheaves forming the lower slopes, and the heads, the upper.

For covering the shocks the smaller sheaves should be reserved, and none very large there admitted. The first course of the cover is made by striking some of the stubble ends of the straw upon the band of the outer sheaves of the foundation, so that some staws go within the band, and thus hold the sheaf where placed. The circle is completed by sheaves so placed, the buts close to each other, and the heads leaning inwards towards the middle of the shock. A second course is carried around in like manner rising on the first, and resting on and within the bands of its sheaves. The point is now nearly reached and formed; and what it wants, is given by using the smallest sheaves. The heads of the last only are exposed, and they will be generally not more than four or five sheaves: and these are protected and secured in their places by a cap, formed of a large sheaf turned with the but upward, and the heads so spread open as to hang over and all around the sides of the peak.

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

The cattle of York and Durham were long celebrated, principally for their reputation as extraordinary milkers. This property they are supposed to have acquired by a cross with a fine milk breed from Holstein, at a remote period. These were, however, different from what are now termed "*Improved Short Horns.*"

"They were generally of large size, thin skinned, sleek haired, bad handlers, rather delicate in constitution, coarse in the offal, and strikingly defective in the substance of girth in the fore quarters.—As milkers they were most excellent, but when put to fatten, as the foregoing description will indicate, were found slow feeders, producing an inferior quality of meat, not marbled or mixed as to fat and lean; in some cases, the latter was found of a dark particular hue. Such, also, are the unimproved Short Horns of the present day, and the distinction cannot be too frequently asserted, because they are in many cases considered as specimens of the improved breeds, and have actually been resorted to in trials as to the comparative aptitude of animals to fatten,—trials which it is evident they could not successfully sustain.

"A period of more than eighty years has now elapsed since the Short Horns, on the banks of the river Tees, hence called the Teeswater breed, has assumed a very different character to that contained in the foregoing description. In colour they resemble the improved Short Horns, being occasionally red, red and white, and roan, though the last named colour was not so prevalent as now. They possessed a fine mellow skin and flesh, good hair, and light offal, particularly wide carcasses, and fore quarters of extraordinary depth and capacity."

To show *how* and by *whom* the *improvement* was made in the Short Horned breed, and its extent, we extract, in full, the account before us:

"The remarkable difference which existed between the Teeswater and the old unimproved Short Horns may, with propriety, be ascribed to a spirit of improvement which had some time manifested itself among the breeders on the banks of the Tees, whose laudable efforts were well seconded by the very superior land in the vicinity of that river. No reasonable doubts can be entertained that they proceeded on a judicious system of crossing with other breeds, because it was utterly impossible to raise such a stock as the Teeswater from pure Short Horned blood. One cross to which they referred was, in all probability, the white wild breed; and if this conjecture be well founded, it will be apparent whence the Short Horns derived a colour so prevalent among them.

"It is also asserted, that about the period in question, Sir William St. Quintin, of Scampston, imported bulls and cows from Holland, which were crossed with the stock of the country. It would tend to little advantage to proceed with conjectures, as to what other breeds were resorted to, if any; this much is certain, that the great improvement was soon manifested, and a valuable variety established, as the two following instances will prove.

"Mr. Milbank of Birmingham, one of the leading improvers, bred and slaughtered an ox, which, at five years old, weighed four quarters, one hundred and fifty stones, of fourteen pounds to the stone, producing sixteen stones of tallow; and a cow bred from his stock, slaughtered by Mr. Sharter, of Chilton, at twelve years old, weighed upwards of one hundred and ten stones.

"From Mr. Milbank's time, the Teeswater cattle continued to sustain their excellence and celebrity in various hands, until Mr. Charles Colling adopted them, when he manifested a superiority of skill as a breeder, which, in a very brief period, secured him an ample fortune.

"Whatever had been the merit of the Teeswater cattle, it is certain Mr. Charles Colling greatly improved them; and though it has been asserted that his success was the result of chance, arising from the possession of an animal, with the merits of which, it so supposed, he was at one period unacquainted; the writer of this article is of the opinion that Mr. Colling's success resulted from a deliberate and well considered plan. He found the Teeswater, like all other extravagantly large cattle, frequently of loose make and disproportion. He was sensible, also, of the difficulty of breeding, with any thing like certainty, *large good* animals; and though he had declined on all occassions to throw any light on his views and proceedings, the writer thinks he can detect, in the very outset, and through the progress of his practice, a resolution to reduce the size of this breed, and at the same time, and by that means, to improve its form. This he is supposed to have effected in the first instance through the medium of a bull called "*Hubback,*" an animal, respecting which, there has been much controversy, principally touching the purity of his blood, a question now of little importance, because it is admitted on all hands that Mr. Colling adopted another cross, which prevails in a majority of superior Short Horns of the present day. It may notwithstanding, be matter of interest to state a few particulars respecting this bull.

"Without entering on an inquiry by what circumstances Hubback's title to be considered of pure blood is supported or weakened, it may suffice to say that it appears probable he possessed, on one side, the imported blood. The possessor of his dam was a person in indigent circumstances, and grazed his cow on the highways.—When afterwards she was removed to good land, she became so fat that she did not again breed, and her son, having the same feeding property in a high degree, was useful as a bull during a very short period. The quality of his flesh, hide and hair, are supposed to have been seldom equalled; and as he was smaller than the Teeswater cattle, he was eminently calculated to forward Mr. Colling's views.

"It has been remarked that we have no superior horse on the turf, which does not boast the blood of the Godolphin Arabian; so it may be asserted that we have no superior Short Horns which do not claim descent nearly, or remotely, from Hubback.

"After the use of the bull, Mr. Charles Colling proceeded, with singular success, to produce, from time to time, superior animals; and the number of bulls he disposed of by letting, was highly en-

couraging. But the circumstance which brought the improved Short Horns into most extensive notice, was the production of the "Durham ox," an animal which speaks volumes in favor of a single cross from this blood; for the ox was the produce of a common cow, which had been put to *Favorite*. At five years old, the Durham ox was sold to Mr. Bulmer, for public exhibition, at the price of £140. This was in February 1801. He was at that time computed to weigh 168 stones, of 14lbs. (the quarters) his live weight being 216 stones; and this extraordinary weight did not arise from his superior size, but from the excessive ripeness of the points. Mr. Bulmer having obtained a carriage for his conveyance, travelled with him five weeks, and then sold him and the carriage, at Rotherham to M. John Day, for £250.

"On the same day Mr. Day could have sold him for..... £525
"On the 13th June for..... 1000
"On the 8th July for..... 2000

"Mr. Day travelled with him nearly six years, through the principal parts of England and Scotland, till, on the 19th Feb. 1807, the ox dislocated his hip-bone, and continued in that state until the 15th April, when he was obliged to be slaughtered, and, notwithstanding he must have lost considerably in weight during his eight weeks of illness, his carcase weighed—

	Stones.	*lbs.*
Four quarters,.....	165	12
Tallow,.....	11	2
Hide,.....	10	2

To effect further improvement, Mr. Colling resolved to resort to the Galloway.

He was much favored by circumstances in promoting his object, which was to take one cross, and then breed back to the Short Horn,—the only course, by the way, in which crossing can be successfully adopted. To breed from the produce of a cross *directly among themselves* will lead to the results which have induced many persons, without due consideration, to believe conclusive against crossing; but to take one cross, and then return and adhere to one breed, will in the course of a few generations, be found to stamp a variety of sufficient certainty.

"Mr. Colling's Short Horned bull, *Bolingbroke*, was put to a red polled Galloway cow, and the produce, being a bull calf, was in due time, put to *Johanna*, a pure Short Horn,—she also producing a bull calf. This grandson of Bolingbroke was the sire of the cow *Lady*, by another pure Short Horn dam, and from Lady has sprung the highly valuable family of improved Short Horns, termed in reproach, *Alloy*.

"It will probably be admitted that the prejudice against this cross was at the highest at the time of Mr. Colling's sale. The blood had then been little, if at all, introduced to other stocks, and it was manifestly the interest, whatever might be the inclination, of the manly breeders who had it not, to assume high ground for the pure blood, and to depreciate the alloy. Under these untoward circumstances for the alloy, what said public opinion, unequivocally certified by the stroke of the auctioneer's hammer! *Lady*, before mentioned, at fourteen years old, sold for two hundred and six guineas. *Countess*, her daughter nine years old, for four hundred guineas.—*Laura*, another daughter, four years old, for two hundred and ten guineas. *Major* and *George*, two of her sons, the former three years old, the latter a calf, for two hundred guineas and one hundred and thirty; besides a number of others, more remotely descended from *Lady*, which all sold at high prices—in fact, in a sale of forty-eight lots, realizing £7,115 17*s*. *Lady* and her descendants sold for a larger sum than any other family obtained."

Vernon, Oneida co. June 3, 1834.

DEAR SIR—Will you be good enough to publish in your valuable paper, the Cultivator, Bolton's recent communication, on the result of crossing the improved Short Horns and Devon cattle, and much oblige A SUBSCRIBER.

J. BUEL, Esq.

[*From the British Farmers' Magazine.*]

RESULT OF CROSSING THE IMPROVED SHORT HORNS AND DEVON CATTLE.

MR. EDITOR—In the 27th number of your valuable Magazine, when giving an account of my two years old steer, you also gave an extract from my letter on the advantages attendant on crossing cows of different breeds with improved Short Horn bulls, and in confirmation of this opinion, (not hastily adopted, but the result of several years' practical experience, and a close attention to the experiments of several friends during the last seventeen years,) I send you the portrait and a short account of a two years old Durham and Devon heifer of mine, lately slaughtered by Mr. Wm. Daniel, of Abergavenny, and accompanying it with a few brief statements of the advantages derived from this system by several of my own personal friends.

This heifer was the second cross, and was of a light grey colour, She weighed 35 scores and 8 lbs. rough fat 98 lbs. She was allowed to be the fattest and best beast of her age, in all points, ever seen in Abergevenny. She had a dead calf about six weeks before Christmas, was dried on the 17th January, and killed the 10th of June. She sold for £19 3*s*. 6*d*.

Her live weight, on the 8th June, was 1232 lbs.
do 17th January, 840

Increase in 140 days, 392

Being aware that strong prejudice and much incredulity existed on the subject of crossing, I courted the attention of all the respectable farmers, breeders and feeders, in this neighborhood; many came to see her when first put up, and repeatedly afterwards during the five months she was feeding, and they all concurred in saying, she went on faster than any beast they ever had seen. She never had any oil cake.

I have seen many excellent beasts bred from *improved* Short Horn bulls and Long Horned cows; indeed, I never knew any of these bulls put to any cow where the produce was not superior to the dam. But the cross which I advocate, and with which I am best acquainted, is that with the Devon cow. I have uniformly remarked, that each succeeding cross was attended with a proportionate improvement in size, quality of flesh, and aptitude to fatten; in every instance they have shown themselves superior milkers, and stand to the pail till within six or eight weeks of calving, and several instances have come under my own knowledge where they have never been dry since they first calved. And so highly are they prized as milkers, that a friend of mine, who hired out dairies, informed me that the dairymen gave him nearly £2 per cow per year more for the half and three quarter breeds, than they would give for cows of any other breed.

A friend of mine had about a dozen North Devon cows, small in size, but nice in quality, and from these he commenced, about twenty years since, breeding with Short Horn bulls. He has since invariably used those bulls. With each succeding cross the stock have rapidly improved in every essential, and the only trace of the Devons which I could perceive when I last saw them, about two years since, was a peculiar richness in their colouring. He breeds about thirty annually, and generally sells his three years olds in the autumn, at from 17 to £22; and I have known him sell in calf, heifers to jobbers, at fairs, as high as thirty guineas each. All his stock are superior milkers. Here we have twenty years experiments, and continued improvement. Within the last eight years I have sent many North Devon heifers to Ireland, to friends residing in different counties, and some of them occupying land of very inferior quality. I also sent over two young Durham bulls, from the stock of the Rev. Henry Berry, to cross them with. They have all crossed them with Short Horn bulls at my recommendation, and the accounts they give are most satisfactory. They say the two years old half breeds are as good as the three years old Devons, and are all good milkers. One of these bulls, by Mr. Berry's Mynheer, has been four times exhibited in three different counties, and has each time taken the first prize. He was last year sold for sixty guineas, and is now serving cows at £1 each.

If any testimony were wanting to corroborate the statement, in No. 26 of your Magazine, of the benefit to be derived from Mr. Knight's methods of cultivating potatoes, I should be happy to add mine. I have for several years been in the habit of planting the entire potato, and making the rows three feet six inches apart, and have found this plan always succeed. I gave them raw to my cattle: to fatting beasts about 40lbs. per day, with hay: to store beasts, about half that quantity with straw: and to my milking cows, I allow 24lbs. daily, with hay. I have given them steamed, but found the cattle did not do well after them when put to grass. After the raw ones, they thrive rapidly on grass. I am sir, yours, very obediently,

C. H. BOLTON.

Brynderry, Abergavenny June, 30, 1833.

From the Genesee Farmer.

SHEEP.

Late in the summer of 1830, I borrowed $100, and went into the neighboring towns and purchased sixty-eight sheep, at the average cost of $1.30 per head, which left me remaining on hand $13 of my borrowed money. At this time I had on hand twelve sheep; which, with those I bought, made me a flock of eighty head. The next winter I kept them on good fine hay, without any grain, until the first of March, when as the ground was bare, I quit feeding hay and turned them out upon my old pastures and commenced feeding a little corn. The winter of 1830–31 it will be recollected, was one of uncommon severity; but notwithstanding its length and coldness, I lost but one sheep, and that by casualty. I continued feeding grain until the first of May, when, as the grass had got a considerable growth, I thought it unnecessary, and quit entirely. That season I raised 36 lambs, which increased my flock to 115. In June I sold the wool produced by my old sheep, for $150.06. I went and redeemed my note, and had *left of money I received for wool*, $44. The winter of 1831-32, I fed my sheep as before, but lost three head; consequently, in the spring, had but 112 to shear, which produced three hundred pounds; this I sold at the very low price of 35 cents the pound, or $105 for 300 pounds. The same season I raised 45 lambs, and sold 60 head of my old sheep for $78 60, making the amount of sales from my flock that season $181.60. In the winter of 1832-33 I lost 6 sheep, in the spring sheared 91; but in consequence of the great proportion of lambs, the produce of wool was small. I retained a number of fleeces for home use, and sold the remainder (176 pounds) for 50 cents the pound, or $88 for what I had to sell.

Thus it will be seen that my flock for three years has averaged 94 head, and that the *actual* sales from it have amounted to $419—The last summer I raised 30 lambs and sold none of my old sheep; consequently in August last, when the three years had expired since my purchase, I had on hand 119 sheep, which is 25 above the average for three years past, and which 25 sheep were worth at that time $2 the head—making $50 for 25. This added to my sales, would make $469 for the produce of 94 sheep for three years, or $156.33 for one—equal to $1.66 per head annually.

I have made the following estimate of the expense of keeping 100 sheep for one year. I may be incorrect, if so, I hope some of your correspondents will correct me.

Twenty acres of good land, well turfed, will keep 100 sheep a year, viz: five acres of meadow, producing two tons of hay to the acre, will winter, and fifteen acres of good pasture land will summer them. Twenty acres of land at $40 per acre would cost $800; and 100 sheep, at $2 the head, $200; making the cost of land and sheep $1.000.

Interest on $1,000 one year, is	$70 00
Cutting and securing 5 acres of grass,	5 00
Thirty bushels of corn at 4s	15 00
One barrel of salt, at 16s	2 00
Washing and shearing 100 sheep,	5 00
	$97 00

If the above estimate be correct, it will be seen that I have realized from my flock a nett profit of more than 50 per cent for three years together. W. G. B.

Genoa, March 31, 1834.

AGE OF SHEEP.

The age of a sheep may be known by examining the front teeth. They are eight in number, and appear during the first year all of a small size. In the second year, the two middle ones fall out, and their place is supplied by two new teeth, which are easily distinguished by being of a larger size. In the third year, two other small teeth, one from each side, drop out and are replaced by two large ones; so that there are now four large teeth in the middle, and two pointed ones on each side. In the fourth year, the large teeth are six in number, and only two small ones remain, one at each end of the range. In the fifth year the remaining small teeth are lost, and the whole front teeth are large. In the sixth year, the whole begin to be worn; and in the seventh, sometimes sooner, some fall out or are broken.—*Mountain Shepherd's Manual.*

Hints to Graziers.—A heifer or cow will make beef earlier than a steer. An old cow, or an old sheep, will not fatten nearly so well with hay as with grass. The longer the straw of any kind, the worse as fodder; short straw is said to be, invariably, the most nutritious. Cattle always prefer that which is fresh threshed, a day even making a difference.—*Lawrence upon Cattle.*

Science of Agriculture.

OF THE FERMENTING, PRESERVING, AND APPLYING OF MANURES OF ANIMAL AND VEGETABLE ORIGIN.

On the management of organic manures depends much of their value as food to plants. The great mass of manures procured by the cultivator are a mixture of animal and vegetable matters, and the great source of supply is the farm or stable yard. Here the excrementitous matter of horses, cattle, swine and poultry, is mixed with straw, haulm, chaff, and various kinds of litter. To what degree should this be fermented before it is applied to the soil? And how can it best be preserved when not immediately wanted?

A slight incipient fermentation is undoubtedly of use in the dung-hill; for, by means of it, a disposition is brought on in the woody fibre to decay and dissolve, when it is carried to the land, or ploughed in the soil; and woody fibre is always in great excess in the refuse of the farm. Too great a degree of fermentation is, however, very prejudicial to the composite manure in the dung-hill; it is better that there should be no fermentation at all before the manure is used, than that it should be carried too far. The excess of fermentation tends to the destruction and dissipation of the most useful part of the manure; and the ultimate results of this process are like those of combustion. It is a common practice amongst farmers to suffer the farm-yard dung to ferment till the fibrous texture of the vegetable matter is entirely broken down; and till the manure becomes perfectly cold, and so soft as to be easily cut by the spade. Independent of the general theoretical views unfavorable to this practice, founded upon the nature and composition of vegetable substance, there are many arguments and facts which show that it is prejudicial to the interests of the farmer.

During *the violent fermentation* which is necessary for reducing farm yard manure to the state in which it is called short muck, not only a large quantity of fluid, but likewise of gaseous matter is lost; so much so, that the dung is reduced one half, or two-thirds in weight; and the principal elastic matter disengaged, is carbonic acid with some ammonia; and both these, if retained by the moisture in the soil, as has been stated before, are capable of becoming a useful nourishment of plants. In October, 1808, Sir H. Davy filled a large retort capable of containing three pints of water, with some hot fermenting mauure, consisting principally of the litter and dung of cattle; he adapted a small receiver to the retort and connected the whole with a mercurial pneumatic apparatus, so as to collect the condensible and elastic fluids which might rise from the dung. The receiver soon became lined with dew, and drops began in a few hours to trickle down the sides of it. Elastic fluid was likewise generated; in three days thirty-five cubic inches had been formed, which, when analyzed, were found to contain twenty-one cubic inches of carbonic acid; the remainder was hydrocarbonate mixed with some azote, probably no more than existed in the common air in the receiver. The fluid matter collected in the receiver at the same time amounted to nearly half an ounce. It had a saline taste, and a disagreeable smell, and contained some acetate and carbonate of ammonia. Finding such products given off from fermenting litter, he introduced the beak of another retort, filled with similar dung, very hot at the time, in the soil amongst the roots of some grass in the border of a garden; in less than a week a very distinct effect was produced on the grass; upon the spot exposed to the influence of the matter disengaged in fermentation, it grew with much more luxuriance than the grass in any other part of the garden. Besides the dissipation of gaseous matter, when fermentation is pushed to the extreme, there is another disadvantage in the loss of heat, which if excited in the soil, is useful in promoting the germination of the seed, and in assisting the plant in the first stage of its growth, when it is most feeble and most liable to disease: and the fermentation of manure in the soil must be particularly favorable to the wheat crop, in preserving a genial temperature beneath the surface late in autumn and during the winter. Again, it is a general principle in chemistry, that in all cases of decomposition, substances combine much more readily at the moment of their disengagement, than after they have been perfectly formed. And in fermentation beneath the soil the fluid matter produced is applied instantly, even whilst it is warm, to the organs of the plant, and consequently is more likely to be ef-

ficient, than in manure that has gone through the process, and of which all the principles have entered into new comb nations.

Checking fermentation by covering.—"There are reasons sufficiently strong," Grisenthwaite observes, "to discourage the practice of allowing dung-heaps to ferment and rot without interruption. It appears that public opinion has slowly adopted the decisions of chemical reasoning, and *dung-pies*, as they are called, have been formed with a view to save what was before lost; a stratum of mould, sustaining the heap, being placed to receive the fluid part, and a covering of mould being applied to prevent the dissipation of the aerial, or gaseous products. These purposes and contrivances, unfortunately, like many of the other operations of husbandry, were not directed by scientific knowledge. To cover is so commonly believed to confine, that there is no wonder that the practical cultivator adopted it in this instance from such a consideration. But it is in vain; the elasticity of the gases generated is such as no covering whatever could possibly confine. If it were perfectly compact, it could only preserve as much carbonic acid as is equal to the volume or bulk of air within it; a quantity too inconsiderable to be regarded, could it even be saved; but every particle of it must be disengaged, and lost, when the covering is removed."

Checking fermentation by watering is sometimes recommended; but this practice is inconsistent with just chemical views. It may cool the dung for a short time; but moisture, as before stated, is a principal agent in all processes of decomposition. Dry fibrous matter will never ferment. Water is as necessary as air to the process, and to supply it to fermenting dung, is to supply an agent which will hasten its decay. In all cases when dung is fermenting, there are simple tests by which the rapidity of the process, and consequently the injury done, may be discovered. If a thermometer plunged into the dung, does not rise to above one hundred degrees of Fahrenheit, there is little danger of much aeriform matter flying off. If the temperature is higher, the dung should be immediately spread abroad. When a piece of paper, moistened in muriatic acid held over the steams arising from a dung-hill, gives dense fumes, it is a certain test that the decomposition is going too far, for this indicates that volatile alkali is disengaged.

In favor of the application of farm-yard dung in a recent state, a great mass of facts may be found in the writings of scientific agriculturists. A. Young, in the *Essay on Manures*, already quoted, adduces a number of excellent authorities in support of the plan. Many, who doubted, have been lately convinced; and perhaps there is no subject of investigation in which there is such a union of theoretical and practical evidence. Within the last seven years Coke has entirely given up the system formerly adopted on his farm, of applying fermented dung; and his crops have been since as good as they ever were, and his manure goes nearly twice as far. A great objection against slightly fermented dung is, that weeds spring up more luxuriantly where it is applied. If there are seeds carried out in the dung, they certainly will germinate; but it is seldom that this can be the case to any extent; and if the land is not cleansed of weeds any kind of manure, fermented or unfermented, will occasion their rapid growth. If slightly fermented farm-yard dung is used as a top-dressing for pastures, the long straws and unfermented vegetable matter remaining on the surface should be removed as soon as the grass begins to rise vigorously, by raking, and carried back to the dung-hill: in this case no manure will be lost, and the husbandry will be at once clean and economical. In cases where farm-yard dung cannot be immediately applied to the crops, the destructive fermentation of it should be prevented as much as possible; the principles on which this may be effected have been already alluded to. The surface should be defended as much as possible from the oxygen of the atmosphere; a compact marl, or a tenacious clay, offers the best protection against the air, and before the dung is covered over, or, as it were, sealed up, it should be dried as much as possible. If the dung is found at any time to heat strongly, it should be turned over and cooled by exposure to the air.

The doctrine of *the proper application* of manures from organized substances, offers an illustration of an important part of the economy of nature, and of the happy order in which it is arranged. The death and decay of animal substances tend to resolve organized forms into chemical constituents; and the pernicious effluvia disengaged in the process seem to point out the propriety of burying them in the soil, where they are fitted to become the food of vegetables. The fermentation and putrefaction of organized substances in the free atmosphere are noxious processes, beneath the surface of the ground they are salutary operations. In this case the food of plants is prepared where it can be used; and that which would offend the senses and injure the health, if exposed, is converted by gradual process into forms of beauty and usefulness; the fœted gas is rendered a constituent of the aroma of the flower, and what might be poison becomes nourishment to animals and to man.

To preserve dung for any time, the situation in which it is kept is of importance. It should, if possible, be defended from the sun. To preserve it under sheds would be of great use; or to make the site of a dung-hill on the north side of a wall. The floor on which the dung is heaped, should, if possible, be paved with flat stones; and there should be a little inclination from each side towards the centre, in which there should be drains connected with a small well, furnished with a pump, by which any fluid matter may be collected for the use of the land. It too often happens that a dense mucilaginous and extractive fluid is suffered to drain away from the dung-hill, so as to be entirely lost to the farm.—*Ed. of Ag.*

[*From Hayward's Science of Agriculture.*]

ON HAY-MAKING.

Having observed that in a season when there was no rain whatever, and the hay had been made with rapidity, and carted within a short time after it had been cut, that a greater quantity was destroyed and injured by being overheated and burnt, than in a catching irregular season; that when hay had not heated in the stack, it is frequently mouldy; that as hay lost its native green colour, and approached a brown, it lost its nutritive qualities; and that altogether the making of hay, as usually conducted, was a very precarious and teasing operation; I determined on trying to arrange a system on some more regular and certain principles, in which I succeeded; and by adopting a certain and regular course of operations, was enabled to make my hay of a uniform good quality: and, let the weather be as it might, at a regular expense of labor. And considering such a process not only of importance, as it ensures a more perfect quality; but as it affords a more certain protection against the injuries usually consequent on the uncertainty of the weather, and overheating in the stack; and that it thus removes two great causes of anxiety, it may be well worth the public attention.

In the first place, as to the state of the weather, it generally happens at this season of the year that there are three or four days dry; therefore on beginning to cut the grass, as it is well known that during wet weather grass may be cut, and suffered to remain in the swarth for several days without injury; and it being desirable, where hands are plenty, to have a good quantity, or so much as will complete a stack in a day, in the same state of forwardness, I should prefer beginning to cut during the rainy weather; however, be this as it may, swarths should not be opened but on a certain fine day; and when this is done, the grass should be well shaken apart and equally spread over the ground. As soon as the upper surface is dry turn it well over; and in this operation great care should be taken to open and spread any cocks that may not have been divided in the first opening. This being done, commence raking into wind-rows, in time that the whole may be made into small cocks before night. *The second day these cocks must remain untouched, let the weather be wet or dry:* the third day, if the weather be certain and fine, throw the cocks open: but if the weather be wet and threatening, they may remain another day, or until the weather is certain to be fine for the day. The cocks should then be thrown, according to the crop, into beds of two or three rows; and after three or four hours exposure, turned over; and taking time to gather the whole into wind-rows and cocks before night, let this operation commence accordingly, *and none be left open;* the day after this, which in fine weather will be the fourth, *the cocks must again remain untouched, or not be opened, whether the weather be wet or dry.* On the fifth or next day, these cocks will only require to be opened for an hour or two, when they will be fit for the stack. The novelty of this mode consists only in suffering the hay to remain in the cock the second and third, or alternate days; and at first sight it may appear that so much time in fine weather must be lost, but this is not the case. Whilst the hay remains in cocks, a slight fermentation, or what is termed sweating, will take place, and in consequence, after it has been opened on the third and fifth days, it will prove to be just as forward as if it had been worked every day. And the advantages resulting from this, are, obviously, the following: by shortening the time of open exposure, the colour of the hay is more perfectly preserved, and consequently the quality; and the fermentations or sweatings which take

place in the cocks, proved so much to have diminished that principle or inclination to prevent its heating injuriously in the stack: and the whole operation of making, whether it takes four days or eight, requires three days' labor only, and the hay being left in that state every night, in which it is the least possibly exposed to the injuries of the weather, and in which it may remain for a day or two in uncertain weather, without injurious exposure, much painful anxiety and useless attendance of laborers are obviated.

Miscellaneous.

IMPROVED SYSTEM OF BEE MANAGEMENT.

There is no branch of rural economy connected with more agreeable associations than that of bee management. The proverbially industrious habits of the insect, and its extreme ingenuity in the construction of its domicil, and the deposition of its treasures, are such as to excite the admiration of the most unobservant. The common necessity of destroying the stock, in order to obtain the produce of their labors, has been always matter of regret. Many plans have been hitherto devised for the purpose of obtaining the honey without the destruction of the bees, but they have only been attended with partial success. The object has, however, been latterly and more perfectly attained by Mr. Nutt, a practical apiarian of Lincolnshire, whose system of management has given this branch of rural economy an importance and value of which it was not before considered susceptible, both in the greater productiveness of the bees, and the much superior quality of the honey.

The first part of Mr. Nutt's plan of operation is to leave the hive, into which the stock is introduced, untouched. When it is filled with honey (the contents of which are to be reserved for the use of the bees,) the capacity of the hive is increased, by the addition of another box to the side, communicating with the hive by apertures, which give free admission to the bees in all parts of the box.

The next important object in Mr. Nutt's system is to ensure a regulated and uniform temperature in this portion of the hive, without diminishing the temperature of that which contains the stock. The ventilation necessary for this purpose is effected by the means of a perforated tin tube, extending down to a considerable distance from the top into the hive, and connected with an aperture at the bottom, which may be partly or wholly closed by a tin slide, thus modifying the circulation of the air and consequent degree of temperature. The temperature of this side box, which is indicated by a thermometer introduced into the tube, ought to be 70°, which is the natural temperature of the working hive; but, in that which contains the stock a temperature of 90° is necessary, as well for the incubation of the queen bee, as the maturity of the young. The parent hive is, then, as well the residence of the queen bee as the nursery of the young, whilst the side boxes are but additional store-houses for the reception of the superfluous honey, which may be taken away without impoverishing the stock, or robbing them of their winter sustenance.

When the thermometer, placed in the side box, rapidly rises to 90° or 100°, the necessity of again providing the bees with fresh room is indicated; and this is effected by establishing another box on the opposite side of the hive. The bees, finding an increase of room, will readily recommence their labors in this new apartment.

Then follows, in Mr. Nutt's system, the operation of separating the bees from this second hive. This is effected by the ventilator, by which the internal temperature of the hive may be reduced to that of the external atmosphere; and when, on the approach of night, the bees recoiling from the cool air, go back into the middle box, the connexion between the two may be closed, and the full hive withdrawn, without the imprisonment or destruction of a single laborer. The same arrangements are to be again renewed, as the bees continue their successful labors. In this system no provision is made for swarming, which cannot occur under this arrangement, the emigration of a part of the stock being only occasioned by a want of room in which the bees may pursue their labors.

The honey furnished under this system of management is found to be far superior, both in quality and quantity, to that obtained under any other arrangements. The honey and wax are as white as refined sugar. This superiority in quality, it owes as well to the modified temperature at which the bees secrete their products, as to its total exemption from all extraneous animal and vegetable matters, and, in particular, from the pollen or bee bread, which is taken, in considerable quantities, into the stock-hive for the support of the young. This superiority of the honey is only equalled by the quantity of the supply: the usual annual supply from one stock is about one hundred weight of honey: whilst, in the course of one season, Mr. Nutt has procured the large quantity of 296 pounds. This increase in quantity is owing to the excellent disposition of the arrangements, by which the industrious efforts of the bees are never retarded, nor their strength weakened at the time when the fruits and flowers most abound from which their treasures are obtained.—*Penny Magazine.*

An experiment on Oats.—Having sown the same oats for several years without changing the seed, my crops became fuller and fuller every year of the *black dust head or blast*, until the loss from this cause, amounted to one-half the crop; and when threshed out, the black dust was so suffocating that the laborers were made sick by it. I determined in 1832, to change the seed, and got one hundred bushels of the purest seed that could be procured in Richmond; they did not quite hold out to sow all the land intended, and I had to use some of my own impure seed—which I washed effectually in very strong lime water, and allowing them to remain in the lime water the night before sowing. It proved an effectual remedy; the product was decidedly more clean on harvesting, than that from the seed procured in Richmond, although that was tolerable pure.—*Farmers' Register.*

Cure for the Botts or Grubs in Horses.—If you will excuse the subject, (for although graceless, it is valuable, not only to the agriculturist, but to all classes using that valuable animal, the horse,) I send a remedy I used while our coals were brought to market in road wagons, which obliged us to use a great number of horses; and I never knew it fail of giving relief in from one to five minutes. Pour out half a gill of spirit of turpentine into the hand, and rub it on the breast of the animal while suffering. Let it be applied to the hollow or pit of the stomach, just at the point where the neck joins the breast, on a space six or eight inches in diameter. The relief is certain if the grubbs have not already cut through the coats of the stomach.—*Farmers' Reg.*

Brimstone for Cattle.—Dr. Bartlett: It is probably not known, to many of our farmers, that brimstone is valuable for cattle in keeping them free from ticks. These vermin are not only filthy in their appearance, but an injury to the cattle. A piece of brimstone as large as a grain of corn, well pulverized, given in a little salt, will cause them to drop off, and prevent others from getting on for eight or ten days. I consider brimstone as necessary for a cow in summer, as salt.—*Southern Planter.*

How to destroy Moles.—Dr. Bartlett: In the last Planter it is stated that the Castor Bean will destroy Moles. I have tried the red Palma Christi (which some say is the same,) with success, merely by planting a few of the kernels in their paths or ploughed places; also calomel, by making holes in grains of corn, and inserting it in the holes and placing the corn in the ground for them. The calomel will not kill them till there comes a rain, when they will be found on the top of the ground.—*Ib.* WM. H. RAIFORD.

Clover among Corn.—A friend of mine sowed red clover among his corn after going through with the cultivator the last time; the seed was protected from the heat of the sun by the corn; it consequently vegetated very soon, and after the corn was cut off, there was a luxuriant growth of clover, which afforded fine pasture for several successive seasons. The red clover is an excellent manure. I have raised a fine crop of wheat by ploughing in the second growth after harvest.—*Am. Far.*

"Every bird thinks its own nest beautiful."—*Italian Prov.* This may be an allusion, either to the innate attachment which all living creatures feel to their home, or to the natural affection we bear towards the place of our own nativity, or that of our offspring.

"The beginning is the half of the whole."—*Hesiod.* The most appropriate illustration of this, is to be found in our own proverb, "well begun is half done."

"Emulation begets emulation."—*Latin.* A spirit of emulation excites industry and diligence: these, by their natural results, induce prosperity, and our success stimulates our neighbor to similar exertion.

Young Men's Department.

WRITINGS OF WASHINGTON.

Among these written in his own hand, is a series of maxims under the head of "*Rules of civility and decent behaviour in company and conversation.*" Of these there are 110. The only specimens published we extract, and agree with Mr. Sparks in the opinion, that "whoever has studied the character of Washington, will be persuaded that some of its most prominent features took their shape from the rules thus early selected and adopted as his guide."—*N. York American.*

1. Every action in company ought to be with some sign of respect to those present.

2. In the presence of others sing not to yourself with a humming noise, nor drum with your fingers or feet.

3. Sleep not when others speak, sit not when others stand, speak not when you should hold your peace, and walk not when others stop.

4. Turn not your back to others, especially in speaking; jog not the table or desk on which another reads or writes; lean not on any one.

5. Be no flatterer. neither play with any one that delights not to be played with.

6. Read no letters, books or papers in company, but when there is a necessity for doing it, you must ask leave. Come not near the books or writings of any one so as to read them unasked. Also, look not nigh, when another is writing a letter.

7. Let your countenance be pleasant, but in serious matters somewhat grave.

8. Show not yourself glad at the misfortunes of another, though he were your enemy.

9. When you meet with one of greater quality than yourself, stop and retire, especially if it be to a door, or any straight place, to give way for him to pass.

10. They that are in dignity or office have, in all places, precedency; but whilst they are young, they ought to respect those that are their equals in birth or other qualities, though they have no public charge.

11. It is good manners to prefer them to whom we speak before ourselves, especially if they be above us, with whom, in no sort, we ought not to begin.

12. Let your discourse with men of business be short and comprehensive.

13. In visiting the sick, do not presently play the physician, if you be not knowing therein.

14. In writing or speaking, give to every person his due title, according to his degree and the custom of the place.

15. Strive not with your superiors in argument, but always submit your judgment to others with modesty.

16 Undertake not to teach your equal in the art himself professes; it savors of arrogancy.

17. When a man does all he can, though it succeeds not well, blame not him that did it.

18. Being to advise or reprehend any one, consider whether it ought to be in public or in private, presently or at some other time, also in what terms to do it—and in reproving, show no signs of choler, but do it with sweetness and mildness.

19. Take all admonitions thankfully, in whatsoever given; but afterwards, not being culpable, take a time or place convenient to let him know it that gave them.

20. Mock not, nor jest at any thing of importance; break no jests that are sharp biting, and if you deliver any thing witty and pleasant, abstain from laughing thereat yourself.

21. Wherein you reprove another, be unblamable yourself, for example is more prevalent than precept.

22. Use no reproachful language against any one, neither curses nor revilings.

23. Be not hasty to believe flying reports to the disparagement of any one.

24. In your apparel be modest, and endeavor to accommodate nature rather than procure admiration. Keep to the fashion of your equals, such as are civil and orderly with respect to time and place.

25. Play not the peacock, looking every where about you to see if you be well decked, if your shoes fit well, and your stockings set neatly, and clothes handsomely.

26. Associate yourself with men of good quality if you esteem your own reputation, for it is better to be alone than in bad company.

27, Let your conversation be without malice or envy, for it is a sign of a tractable and commendable nature, and in all cases of passion, admit reason to govern.

28. Be not immodest in urging your friend to discover a secret.

29. Utter not base and frivolous things among grown and learned men; nor very difficult questions or subjects among the ignorant, nor things hard to be believed.

30. Speak not of doleful things in time of mirth, nor at the table; speak not of melancholy things, as death and wounds, and if others mention them, change, if you can, the discourse. Tell not your dreams but to your intimate friends.

31. Break not a jest where none can take pleasure in mirth—Laugh not aloud nor at all without occasion. Deride no man's misfortune, though there seem to be some cause.

32. Speak not injurious words, neither in jest or earnest. Scoff at none, although they give occasion.

33. Be not froward but friendly and courteous; the first to salute, hear and answer, and be not pensive when it is time to converse.

34. Detract not from others, but neither be excessive in commending.

35. Go not thither, where you know not whether you shall be welcome or not. Give not advice without being asked, and when desired to do it, do it briefly.

36. If two contend together, take not the part of either unconstrained, and be not obstinate in your opinion; in things indifferent, be of the major side.

37. Reprehend not the imperfection of others, for that belongs to parents, masters and superiors.

38. Gaze not on the marks or blemishes of others, and ask not how they came. What you may speak in secret to your friend, deliver not before others.

39. Speak not in an unknown tongue in company, but in your own language; and that as those of quality do, and not as the vulgar.—Sublime matters treat seriously.

40. Think before you speak; pronounce not imperfectly, nor bring out your words too hastily, but orderly and distinctly.

41. When another speaks, be attentive yourself, and disturb not the audience. If any hesitate in his words, help him not, nor prompt him without being desired; interrupt him not nor answer him till his speech be ended.

42. Treat with men at fit times about business, and whisper not in the company of others.

43. Make no comparisons, and if any of the company be commended for any brave act of virtue, commend not another for the same.

44. Be not apt to relate news, if you know not the truth thereof. In discoursing of things you have heard, name your author always. A secret discover not.

45. Be not curious to know the affairs of others, neither approach to those that speak in private.

46. Undertake not what you cannot perform; but be careful to keep your promise.

47. When you deliver a matter, do it without passion and in discretion however mean the person may be you do it to.

48. When your superiors talk to any body, hear them, but neither speak nor laugh.

49. In disputes be not so desirous to overcome as not to give liberty to each one to deliver his opinion, and submit to the judgment of the major part, especially if they are judges of the dispute.

50. Be not tedious in discourse, make not many digressions, nor repeat often the same matter of discourse.

51. Speak no evil of the absent, for it is unjust.

52. Make no show of taking great delight in your victuals, feed not with greediness, cut your bread with a knife, lean not on the table, neither find fault with what you eat.

53. Be not angry at the table whatever happens, and if you have reason to be so, show it not—put on a cheerful countenance, especially if there be strangers, for good humor makes one dish a feast.

54. Set not yourself at the upper end of the table, but if it be your due, or the master of the house will have it so, contend not lest you should trouble the company.

55. When you speak of God or his attributes, let it be seriously, in reverence and honor, and obey your natural parents, although they may be poor.

56. Let your recreations be manful, not sinful.

57. Labor to keep alive in your breast that little spark of celestial fire called conscience.

SELF-EDUCATION.—BY JOHN NEAL.

But who are the privileged class in our country, where all men are equal—where we have no kings, no princes, no nobility, no titles! Look about you, I say again—look about you, and judge, every man for himself. Are they not the *better educated*, every where—and the children of the better educated—throughout the land? Go abroad among your neighbors, let all you acquaintances pass in review before you—and see if those who are better off in the world, more influential and happier than the rest, *other circumstances being equal*, are not all—all, without one exception, better educated than the rest! It is not a college-education that I speak of here; it is not even a school-education obtained before a man sets up for himself—but it is education at large, in the broadest and best sense of the term—the education that any body may give himself,—*any body at any age*. Again therefore, I do appeal to yourselves to call to mind any of your acquaintance who has got ahead of his brethren—who is looked up to, not only by them but by others—and my life on it you find him a better-educated man, self-educated, or otherwise, I care not, better informed about some things which *they* do not consider of importance. I go further—so perfectly satisfied am I of the truth of this doctrine—of the importance of things which the uneducated regard as trivial, that I would have this taught as a fundamental truth, namely, that if two persons were to begin the world to-morrow—both of the some capacity—both of the same age and same character—having the same freinds, the same prospects and the same health—he who was the best acquainted with the multiplication table, would beat the other in the long run. I would have it generally understood as another fundamental maxim in morals, if not in religion, that every sort of knowledge is of some value to every person whatever may be his character, station or prospects. I do not say that it would be of *equal* value to every person, or that every sort of knowledge is alike *necessary*. I merely say that we cannot acquire any *useless* knowledge.

But, say those who appear to have understanding and judgment in these matters, we have no time for study—we, the mechanics.—No time for study! What! have you no time, when a huge ponderous body is to be lifted—no time to fix the lever and the fulcrum—to prepare the inclined plane or hitch the takle? Is it economy of time for you to do that with your hands, which might be done with the simplest piece of machinery? Would you set your apprentices to work, your journeymen and yourselves, to lift and carry, by main strength, what a child might push forward on a roller, if you would but take time enough to fix the roller? What would you say of a man who, instead of using the plough, as others do, should persist in digging a lage field with a fire shovel, because he had never been brought up to the plough? What if a man who, instead of splitting his logs for fire-wood, with a beetle and wedge, were to saw them in two lengthwise, with a key-hole saw—declaring all the while, that as for him, he did not pretend to know much about mechanics—that a key-hole saw was good enough for him—and as for the beetle and wedge, and other out-of-the-way contrivances, for his part he had no belief in them.

Would you not laugh at him as a poor economist of *time*—and a very poor reasoner? and would he not be likely to continue a very poor man? Yet he would say no more than you say—every man of you; when you declare you have no time for reading—no time for study—no time to improve yourself, each in his own particular trade, by stepping out of the circle he was brought up in. How do you know but there is some shorter and easier way of doing *all that you do* in your workshops and factories? Be assured that there is a shorter and easier way for all us—that there is no one thing we do, in which improvements may not be made. Have you not the proof continually before your eyes? Are not the *master workman* the *owners* and the *employers* of other men—are they not those who have made the best use, not of their *fingers*, but of their *thinkers*?

Weanling calves will not fill themselves even in the best grass, but look hollow, and wander about bleating, unless they have plenty of water. In the straw yard, cattle will be more thrifty for having water at command, having on account of the dryness of their food, need of drink several time in a day.—*Lisle.*

Stalled oxen, as they grow fat, being naturally very hot, can scarcely be kept too cool, provided they are dry. Lean cattle can scarcely be kept too warm.—*Lisle.*

"It is a fraud to conceal fraud." A person concealing delinquency becomes, in some degree, an accomplice.

THE CULTIVATOR—AUG. 1834.

TO IMPROVE THE SOIL AND THE MIND.

RIBBON GRASS.

The ribbon grass of our gardens, (*Phalaris Americana,*) is likely to become of great value in our husbandry: it has been found to be better adapted to wet, boggy grounds, than any other species of grass; to propagate rapidly, either by its seeds or by its roots; to yield a very large product in hay or pasture, and to be well adapted to farm stock. The first suggestion of this fact, came to us in a letter from *Abednego Robinson*, of Portsmouth, N. H., who says the discovery was accidental.

"A neighbor," he says, "wishing to get rid of some of the roots which incumbered his garden, threw them into a bog, where they took root, and spread over a large space of ground, excluding every other plant. The water flows through the roots at all seasons.—The turf has become so solid as to bear a cart and oxen. I walked through this grass when in bloom, and never beheld a more handsome and luxuriant growth. It stood perfectly erect, full of large leaves, even, and from four to five feet high. It will produce two good crops in a season, and springs up immediately after the scythe. It produces excellent food; cattle feed it close, and appear to be more fond of it when made into hay than any other grass. I have spoken for one-half of the roots of the patch, and have ground ploughed in my meadow, into which I intend to transplant them, at about the distance of corn hills."

On a recent visit from the Hon. *E. Goodrich*, of Hartford, we were happy to receive, from that gentleman, a confirmation of the good opinion of the *phalaris*, which had been induced by Mr. Robinson's letter. It has been found as beneficial in Connecticut as in New-Hampshire. Not recollecting the particulars narrated, we would beg of Mr. Goodrich, when he sees this, to forward them to us, in order that we may publish them correctly. The subject merits further attention; and if our anticipations are not irrationally founded, the *Phalaris Americana* will yet become the gama grass of the north. It is truly perennial, spreads rapidly, and may be inoculated in the manner suggested by Mr. Robinson, especially in a soil saturated with water, with great facility, and at a trifling expense.

Hops.—There are, according to the Quarterly Journal of Agriculture more than 47,000 acres appropriated to the culture of hops in Great Britain. The duties paid to the government upon this crop, in 1826, amounted to £269,331, or $1,195.830—a small item of taxation which the American hop grower is exempt from paying.

M. Payen has made a discovery that may be of use to the farmer: It is, that polished instruments of iron and steel may be preserved from rust by keeping them in solutions of potash, soda or even lime Thus, one part of potash or soda, in two or three thousand parts of water, will preserve from oxidation, bars of iron, &c. immersed in it. Lime water will do the same.

We learn from Mitchell's recent agricultural tour in Holland, that one of the laws passed during the reign of the present sovereign, *obliges each student of divinity to attend a two years course of lectures on agriculture before being licensed.* Such a regulation is highly calculated to increase the usefulness of the clergy, and to impart to them a salutary influence over the habits and manners of society.

THE GRAIN WORM.

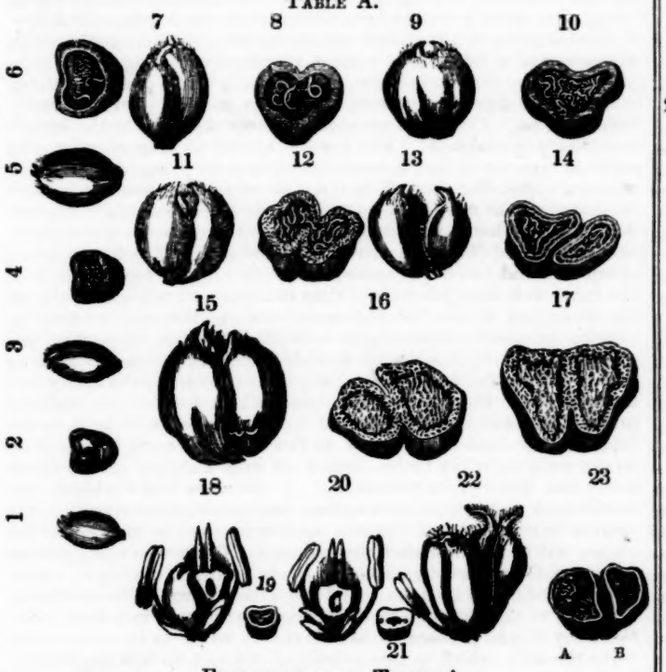
The injury to our wheat crop, this season, by this minute but destructive enemy, surpasses by far all former years. Spring as well as winter wheat is attacked by it, and it has been found in rye growing among wheat. We have taken from the sheath of a kernel of wheat, half a dozen of these worms. Although we do not pretend to accuracy, we should judge, from the information we have received, that the product is likely to be reduced one-half in this neighborhood, by their ravages, the present season. We do not learn that the grain worm has extended itself more than fifty miles west of this city, though there is reason to apprehend that it will too soon be known in the western section of our state. The evil which is already felt, and more so that which is to be feared, renders it a matter of the first importance to learn the character and habits of this insect, the better to be enabled to guard against its depredation.—With this view, we invite correspondents to communicate any facts or observations which may tend to throw light on the subject.

The common impression seems to be, that the insect is a weevil, which deposites its eggs as the grain comes into blossom; and many profess to have discovered the fly upon the wheat ear. This hypothesis should be received with caution, as it tends to discourage efforts, to arrest the evil, and because we think it is founded in error. Flies naturally resort to the haunts of insects, to feed upon the excrementitious matters which there abound; and their presence is often mistaken for the cause, when it is only the consequence of the existence of larvæ.

In the second number of the Cultivator, we made some remarks upon the wheat insect, and gave extracts from a publication of Mr. Bauer, relative to the grain worms, (*vibrio tritici.*) We are so strongly of the opinion, that the insects described by Mr. Bauer are the identical ones which are now preying upon our wheat, that we have thought it worth while to incur the expense of cuts, delineating the appearance of the affected grain, and of the worms as they appeared on different examinations. This will enable the reader to decide with greater certainty upon their identity with our wheat worm; and should this be found to exist, to apply with confidence Mr. Bauer's preventive, viz. to soak the seed grain in lime water. As the causticity of the lime is depended on to kill the nit on the seed, particular care should be had that the lime is fresh burnt, and has not become effete by air slaking. There is a double inducement to try Mr. Bauer's plan. If it does not prevent the ravages of the worm, IT WILL PREVENT SMUT.

The reader will refer to No. 2, for Mr. B.'s remarks, the whole of whose communication may be found in the London Philosophical Transactions of 1823.

TABLE A.



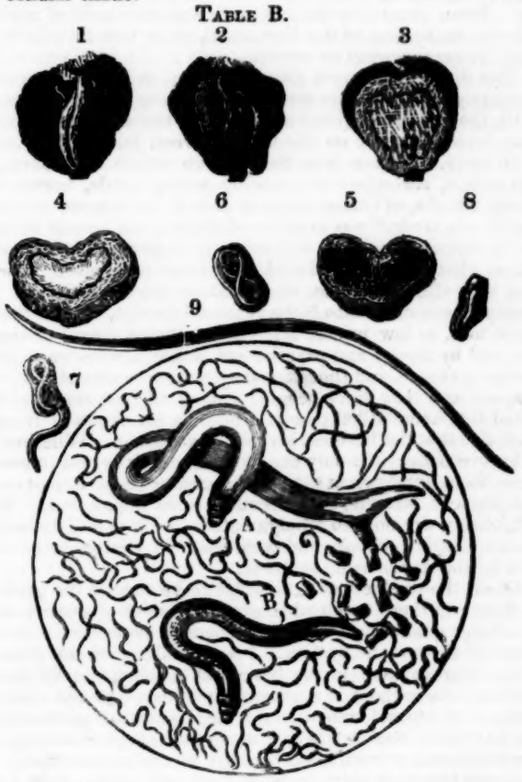
EXPLANATION OF TABLE A.

[Each of the figures in this table are magnified five times in diameter, or fifty times superficially.

Fig.

1. A germen infected with grain worms from the apex of a wheat ear, before it had emerged from its hose; examined the 5th of June, 1808.
2. A transverse section of the same, containing one single large worm, but no eggs.
3. An infected germen from the base of the same ear.
4. A transverse section of the same, containing one large single worm and some eggs.
5. A somewhat larger germen, examined the 13th of June.
6. A transverse section of the same, containing two large worms and many eggs.
7. An infected germen, examined June the 21st.
8. A transverse section of the same, containing several large worms, many eggs, and some newly hatched lively worms.
9. A somewhat larger germen or grain, examined the 27th of June.
10. A transverse section of the same, containing several large and several young worms, and a great many eggs
11. An infected grain, examined the 15th of July, 1808.
12. A transverse section of the same, containing seven large worms of different sizes, some laying their eggs, some not quite mature, many young worms, and a great many eggs.
13. An infected grain nearly divided into two parts, examined July the 15th.
14. A transverse section of the same, containing several large worms some laying their eggs, some already dead, a great many young live worms, and many eggs.
15. A full grown infected wheat grain, examined July the 30th, just beginning to change its colour.
16. A transverse section of the same, the cellular tissue divided into two cavities, filled to excess with young worms all alive, but no trace of the old worms nor of the eggs existed.
17. A longitudinal section of the same.
18. A double germen found in one floret of an inoculated plant, examined June the 5th, 1808; the seed corn was inoculated with worms, and and germen proved infected with worms and the other was perfectly sound. There were also two stunted anthers in that floret.
19. A transverse section of the infected germen which contained one large worm.
20. The sound germen, after the infected one was removed.
21. A transverse section of the sound germen.
22. Another double grain found in one floret of a plant, the seed corn of which had been inoculated with the worms and with the fungi of the smut balls; both diseases had taken effect; examined July the 18th, 1808. One grain was found infected with worms and fungi, and the other with fungi only; there was also one small anther in this singular floret.
23. A transverse section of the same; in the germen A, are two nests or groups of worms closely adhering to some remains of the cellular tissue; the other germen B, is entirely filled with the fungi of the uredofœtida or smut balls, and has no trace of the cellular tissue.

TABLE B.



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[*The Grain Worms—Vibrio Tritici.*]

EXPLANATION OF TABLE B.

[In this table the figures 1 to 5 inclusive are magnified five times in diameter, or 50 times superficially; figures 6 to 9 are magnified 100 times in diameter, or 20,000 times superficially; and figure 10 is magnified 30 times in diameter or 1,800 times superficially.]

Fig.

1. A front. and fig. 2, a back view of an infected ripe wheat grain, examined August the 5th, 1805.
3. A longitudinal section of the same filled with hundreds of worms cemented together, in a torpent state.
4. A transverse section of the same.
5. The transverse section of a grain nearly ripe, which was inoculated and infected with the worms and the fungi of the smut balls, containing several large and some small worms, and filled with the fungi of uredofœtida or smut balls.
6. A newly laid egg with the young worms visibly coiled up in it.
7. A young worm in the act of extricating itself from the egg.
8. An egg from which the worm is recently come out, after which the egg soon shrivels and decays.
9. A young worm which had been some time extricated from the egg.
10. A group of grain worms of all sizes, as seen under water in the field of the microscope, examined July the 15th, 1808: at A is one of the largest parent worms in the act of laying or casting its eggs; at B is a smaller parent worm not yet come to maturity; the rest are young worms all very lively.

CORRESPONDENCE.

ON THE DAIRY FARMING OF HERKIMER.

TO THE EDITORS OF THE CULTIVATOR.—*Gentlemen*—Agreeable to your request, I submit to your disposal an article on cheese husbandry, together with some statements and observations, on the rapid increase, extension and improvement in that department of agriculture, in a narrow district on the north side of the Mohawk river, and second tier of towns, and in the counties of Herkimer and Oneida. Over this district was spread a sparse population as early as the year 1800, and by 1815, it had become a tolerably well settled country. From about this time to the commencement of navigation on the eastern section of the Erie canal, there was here little advancement in improvement or wealth.

This district, in length about 20 miles, is hilly, well watered, and peculiarly adapted to grazing, but not so to wheat. From 1806 to 1815, the subscriber (bred to the use of the axe, plough and scythe.) made a cheese dairy on the farm whereon he now lives, of from 25 to 30 cows. Cheese was then not an article of export; it was a dull article, secondary to growing young cattle, horses and wool. About 200 lbs. of cheese to each cow in the season, at about 6 cts. per lb. "in trade," was considered about a fair income in those days, and is supposed to be so still in many large sections of our country. About that time, I reduced my dairy to a mere family use.—Not long after this time, some cheese speculators from Berkshire county, Mass. came into Norway in said district, bought their cheese, a few tons, at low prices, made contracts for longer or shorter periods, and by theory and practice put a few farmers on a good manufacturing course, and thus encouraged them to extend thier dairy operations, and they have been extending till last season. It is computed that about 1,300 tons of cheese were exported from this district, and that the business is rapidly extending. Whether it is soon to be overdone, time only can determine. It is now questionable if there be in any town in the state a greater proportion of opulent and independent farmers, in proportion to its population. Most of the little farms are now so amalgamated, that it is said to be difficult to sustain district schools, and open roads in winter, or hire any laborers by the day in some sections.

Of all the products of agriculture to be seen in the great markets, in none can there be found so great diversity of quality and masses of inferior qualities, as in that of cheese; none evince such general want of theory and system. I am speaking of the great mass.—Great improvements in any branch of industry usually proceed from sections where there is a community of exertion and spirit of enterprise, rivalship and emulation directed to any one given object. And we have here also at this day much advantage in sale as well as in improvement, over an insolate dairy in another section. Here the greatest cheese dealers in New-York and other cities come to select and purchase their supplies.

In 1828, *we* (myself and sons,) commenced cheese making again from 40 cows, as a prime object, and in the full conviction that there had been and might be, in that department, great improvement, both in the manufacture and management of cows to get the greatest yield; that the principles involved in cheese making might be elicited and developed, and reduced to system, if not a science, by experiments, by interchange of views with intelligent farmers, and observing their process. Here the business conversation when farmers meet, turns much on this subject. How much cheese per day, each cow? In the various seasons of the year, how much each cow through the season? are passing questions, and are put by friends remote also. Answers to these, and the theory of cheese making, the subscriber has often been called upon to put on paper, and to point out as distincntly as might be, the difference between the former and the latter process, as practised by himself and others. This has been done by saying that the yields per day at full grass in May, will range from two and a half to four pounds each cow, as they come from the press, and will shrink about ten per cent at six months maturity. The yields per cow in this section, through the season, may range from 250lbs. to 500lbs. each cow; the latter however is an extreme point, at which very few arrive; the calf being taken from the cow the first week. Last year, we made from 78 cows 32,000 lbs. Our cows, though good for so large a number, are not as select as some smaller lots. Others had greater yields.

In stating the difference between the former and latter process of making, we say that less heat on the milk and through the making process, and less salt has been applied; the cheese made soft, and preserved in shape and from spreading and cracking, and the depredations of flies, by bandaging. This is done with thin cheap cotton cloth, soon after it comes from the press, if the weather be hot.—Cheese making is a chemical operation, subject to atmospheric influences, and to know how to meet its consequent exigencies, consists in a great measure the art. The milk is "set" (rennet applied) in warm weather considerable below the warmth of milk directly from the cow. Cool weather requires more warmth, as the heat is continually passing off. The rennet should be free of taint, and made in quantity to last several weeks, that its power can be relied upon to "fetch the cheese" in three-quarters of an hour, or be sure in an hour be so congested as to be ready to "break up," which is done with the hands from bottom to top of the tub or vat, or with an utensil made of fine brass wire like a riddle, in half inch squares, a sharp rim, and two bails crossing each other higher than the milk in the tub. It is then left a short time to settle; then begin to dip off the whey, and of the first put some over the fire, and as soon as may be, gradually increase the warmth in the tub, dipping off the whey and making fine the curd, endeavoring by all means to keep the whey as green as possible; the greener the whey the richer and more cheese. For the last half hour, which we call the scalding process, we have very little more than animal or milk heat in the tub, with the curd made nearly as fine as Indian corn, which, if all works well, is ready to be dipped off into a cinque or basket in about two hours from the setting. If the whey turns whitish, and smells rank and sour in hot weather, less heat should be applied, the process hurried on, and the salt applied as soon as may be, or the cheese will be much smaller, dry and hard. Those who apply greater heat in scalding, usually cool off in the tub with cold whey or water. But as tending to be more round and adhesive, we prefer cooling by exposure to the atmosphere, in grinding up the curd in a mill, (after the whey is well pressed off in a strainer,) so as to be ready to receive the salt, which is two pounds of dry salt to 100 lbs. cheese, made so dry that very little can pass off in the whey. No injury can be sustained by severe pressing; it may as well be done in one as two days; it must be effectual.

The colouring (if any,) should be of annato, dissolved in pure strong ley, kept in a dimijohn or glass bottle. One large spoon full may colour the milk for 20 lbs. of cheese. The colouring on the outside should be the same, very much diluted, and applied with a brush as soon as the cheese comes from the press. After drying an hour, should then be ointed with butter or lard, and ever kept moist with the same to prevent cracking.

We do not darken our cheese rooms or attempt to keep out the flies, but in hot sultry weather open the windows and doors and give them air. Cool dry winds blowing directly on will crack the cheese. Black or Cayenne pepper applied to cracks or unsound places will prevent depredation by flies. In extreme hot weather, it may be well to let the cheese pass one day without turning. We keep up

a generous warmth in our cheese houses spring and fall, and in all the cool damp days in midsummer, and so greatly accelerate the maturing process. The soft cheese ripens much sooner than that made dry and hard. The latter will dry sooner, but maturing and drying may be very different. Cheese will shrink in weight three to one in October that it will in August, and yet it will ripen three to one in August that it will in October; it ripens like the vegetables, in proportion to the warmth of the atmosphere. Many suppose that large cheeses require more time to ripen and mature than small ones, but we think not. Is not the ripening process of a chemical nature, rather accelerated by increased mass, as are those of the brewer and the baker in their chemical operations? A very small chesse or piece of cheese will soon become dry, but without maturity or taste. Making cheese night and morning from milk directly from the cow, has often been tried in this vicinity, but I know of no one who continues the practice. The yield is said to be greater, but the cheese rank, retaining that kine animal taste peculiar to milk directly from the cow. We carefully avoid extra heat, even on any part of the milk, as tending to prepare the oily material for a separation when coming to maturity on the shelves. In preparing the milk for the rennet, we therefore choose to heat much milk a little, rather than heat little much. Large tin vats, adapted to the size of the dairy, are coming into use; by this vat, to contain 300 galls, we had anticipated an absolute certaintay of having sweet milk in extreme hot weather; but after a severe thunder storm our milk was lobbered worse than ever. Do large metallic reservoirs attract the electricity with which the atmosphere is charged at such a season?

The modern plan of making cheese houses large, that the cheese be chiefly kept on counters, is a great improvement.

Steuben, settled by that noted Baron, being in the same range of towns, and adjoining, is almost wholly devoted to butter making. I have not the means to give any detail, or to state the amount sent to market last year.

The pine apple cheese, weighing from seven to eight pounds each, is made here to considerable extent, mostly, *now*, by the small dairies. The making process, till it is fitted for the press, is much the same as has been here detailed; some add a little more salt. The shrinkage is considerable more, and the dairy furniture more costly, and the whole labor till fit for market may be about the same. It is chiefly made under contract, from eight to nine cents, unless the purchaser finds the pressers, nets and trenchers; if he do so, seven to seven and a half cents. It is pressed in wooden semi blocks, griped together, and when taken from the press suspended in a net till so hardened as to stand on a trencher made for that purpose till fit for market. We estimate a loss of three pounds weight of cheese for every pound of butter taken from it.

Although I have already extended this article to what I fear may be considered tedious to the editors and their readers, you will, I think, pardon me for suggesting that Dr. Rodney Starkweather, of Chesterfield, Mass. has made an experiment on bee management that would be very interesting to the curious. It is a beautiful apartment in the ridge of his barn, into which two or three men can enter by a door. The time the tenement has been thus occupied, and the estimate of honey, &c. &c. I will not venture to state, but think he would do so if requested. Respectfully submitted.

EPHRAIM PERKINS.

South Trenton, Oneida county, N. Y.

Shoreham, Vt. June 23, 1834.

SIR—About a year since, as I was perusing an agricultural work, I saw an extract of yours on the culture of Indian corn, together with a description of the "cultivator," and a recommendation of the "harrow to precede the hoe," all of which I much approved. But reflecting on the variety of soils of which many of our Vermont cornfields are composed, and the sudden transition from wet to dry, which renders them crusty, and many others situated so low that in a wet season, in spite of the vigilance of the most perfect farmer, wild grass and noxious weeds will take deep root, which will be beyond the power of the harrow to remove, while the compound crusty field will be beyond the ability of the cultivator to pulverize—I was led into a series of reflections to invent a machine to obviate these difficulties and adapt itself to the wants and general interests of farmers.

I have just accomplished one, which I have the pleasure to state I have tried with equal success on crusty grassy fields, on seeded and well subdued soil, and think I may safely say, exceeds any in common use, provided the field is free from roots and stone. It is made agreeable to the description of your "cultivator" to eradicate, with three cultivator and four harrow teeth; a cultivator tooth in the centre, a harrow tooth in each extension; thus in succession throughout. It will be obvious to the practical farmer that the angling position and cylindrical form of the cultivator teeth will be directly calculated to force through crusty fields and cut up stubborn rooted noxious weeds, at the same time throwing it directly in contact with the harrow teeth, which, in addition to the common use perfects the work by pulverizing. It will also be noticed that the harrow teeth stand last in the extensions, thus permitting the machine to run nearer the plant without bruising, covering or cutting the roots. The men whom I have employed in hoeing confidently affirm that it is a great saving of manual labor.

Sir, I have been encouraged to forward this communication by the very polite invitation of the superintending committee of "The Cultivator," and should they deem it worthy a place in their columns, will highly oblige a friend to the public interest and a patron of the Cultivator. Yours respectfully,

SCIOLOUS.

Bridgewater, N. Y. July 24, 1834.

J. BUEL, Esq.—It is with much satisfaction that I notice in a late number of the Cultivator an invitation to writers to give their signatures, as it gives your readers an opportunity to correspond with those writers. Also an invitation to forward for publication descriptions of new plants and seeds. I sent some time since a communication on the culture of Madder to the New-England Farmer: since then, I have planted nine acres, and as I have given in the Farmer a particular description of the article, together with the mode of cultivation, and also in the Otsego County Almanac for 1834, will not trouble myself or your readers with a very lengthy article at this time on the subject. In the circle of my acquaintance I think there may be of madder under cultivation, about twenty acres. I began the cultivation in the spring of 1831. I planted the top roots, or seeds, in hills four feet apart each way, 250 hills or about one-ninth of an acre; kept it free at all times of weeds, and for two seasons continued to throw earth on the tops, thereby increasing the quantity of top roots, and promoting the growth of the bottom. I dug the madder last fall, washed and air dried them two or three days, and afterwards perfectly in a kiln, ground them in a grist mill and weighed; the result 135 pounds, and I believe the top roots, or seed, if I had dried and ground them, would have weighed about fifty pounds, making 185 pounds, at nineteen cents, would amount to $35.15, or $316 per acre, but as I sold the top roots for seed, they brought me a far greater sum. In 1832 I planted 600 hills in one piece of ground, same distance as before—this will be dug the ensuing fall, and the seed forwarded to Albany, if any person should request me to do so. The price here in September and October will probably be about $3 per bushel, by the quantity.

In 1833 I planted eight acres in drills, scant six feet in the rows, and one foot in the drills, and should, if the ground had been free from that terrible scourge, (quack grass,) have planted forty-eight bushels. I hired this piece of ground just after a harvest of wheat, and was ignorant that it was covered with quack in the room of wheat: this circumstance, in the following spring compelled me to plant seventy bushels in room of forty-eight. The whole expense in cultivating this crop should not have exceeded $800 for four years, but in consequence, it will probably cost $1,000. The profits of other crops between the rows of madder to be deducted from the expense, the amount of the crop when fitted for market, four years cultivation, a clean and rich piece of land, calculating madder at one shilling, would be $2,000. I planted this piece of ground about the last of April or first of May, and about the first of June after I had cleaned the drills of weeds, I planted between them alternately, corn and potatoes. I had 1,070 bushels of pink-eye potatoes, sixty bushels of corn; the corn being eleven or twelve feet apart did not do very well, and the worms were very plenty; the potatoes were perhaps better for being planted at so great a distance. I consider the quantity of ground planted with potatoes and corn, each about two and a quarter acres. The ground for the potatoes was furrowed, and the potatoes covered with the plough, and hoed once. I made in this piece some experiments in the cultivation of potatoes which I shall be glad to communicate to the public through the columns of the Cultivator. 1834, this spring planted potatoes between every other drill of madder; after having wed and covered the madder tops once,

the crop may be about 6 or 700 bushels. I believe the price of good Dutch madder for twelve years past, has averaged about fifteen cents through the year, and eighteen cents in the fall in the New-York market. The madder of this country is worth three or four cents more; at any rate, I have not known any sold at wholesale to merchants in the country short of twenty-three cents. The cost of raising this article is about seven cents per pound, that is, the whole expense of cultivating, washing, drying, grinding, &c. including a fair rent for land. The least quantity I have seen dug from an acre is 1,600 pounds, and greatest 2,400 pounds, four years. If I had first rate of land, and price of madder good, I should dig third year. Mr. Jefferson in one of his letters from France, says "they cultivate madder here at an immense profit, they dig it once in five or six years." I estimated that in planting the nine acres I should furnish a supply for the county of Oneida, since which time a calico manufacturer of Otsego county has informed me that he uses 100 pounds of madder per week through the year, which is more than I raise. I will now give you my reasons for thinking that it is not an impoverishing crop; the 250 hills that I planted first, was on a hemlock soil of ordinary strength, and at the depth of fifteen inches was a brown dead sand, hard pan, if I may so express it, and as the madder roots penetrate two feet or more, they could not have done so well as on a rich deep soil, still I had over 1,600 pounds. I have on the same ground an uncommon heavy crop of oats, and no manure has been put on it for six years past.

Notwithstanding I have extended this communication to a greater length than I expected when I commenced writing, still I should wish hereafter to say something more should you think the subject worth the trouble it may be to you.

With great respect, yours, RUSSEL BRONSON.

Note.—Mr. Bronson's further communications, on this or other subjects of husbandry, are respectfully solicited.—*Conductors.*

Canaan Centre, July 21st, 1834.

SIR—As I have seen but little in the Cultivator on the management of sheep, and am interested in that part of agricultural pursuits, I venture to direct to you a few thoughts in hopes it may call the attention of others to the subject, more competent than myself. It is allowed by all, as far as I am informed, that the grub in the head of sheep is caused by a fly in the hot season; to avoid the bad effects of which, I would recommend that they have better pasture in the months of July and August, so as to be able to get their supply of food without being obliged to feed in the middle of the day. I have observed that sheep will do well on very short feed early in the season, and think it best if they are to be kept short, it should be done at that time, and reserve for them good feed through the hot season. Flocks of sheep kept close are more likely to be troubled with them than those well kept, and some suppose want of strength to throw off the grub makes the difference, but I think it is being under the necessity of feeding in the heat of the day. Short keeping makes fine wool, but I believe it is best for every wool grower not to overstock, but keep well what he does keep. My practice has been, to select in the fall my poorest sheep from the others and give them better feed, so that all shall be in good condition for winter; in managing in that way, I have lost less sheep in winter than in summer—my lambs I wean the latter part of August and give them the best feed I have, till winter; about the first of November, or whenever the feed becomes injured with frost, I begin to feed them oats in the sheaf; to sixty or seventy lambs I give two bundles a day till about the first of January, and then one bundle a day till February, after which I feed no more grain. In that way, I have been able to get my lambs through the winter, strong and healthy, and out of the above number, for several years I have not lost more than to average one a year. D. S. C.

Tillage Husbandry.

EXPERIMENTS IN TOPPING CORN.

It was discovered early in August, 1810, that proper grasses for soiling my cattle would soon be very deficient; and on the 20th of that month, one row of corn, in a field of thirteen acres, was topped, to ascertain how the plant would bear early cutting. It was thought that it had received no injury. On the 31st of the same month I commenced feeding the cattle with the tops cut daily, as wanted. These lasted them until the 18th of September. After this the blades were stripped, commencing where the topping began. They fed the cattle until the 5th October.

In the process of topping and blading, one row was left entire, standing between the row which had been topped on the 20th of August, and another row that was topped on the 2d of September. These rows were cut off by the roots on the 2d of October, and hauled in and set up separately under my own inspection. They were husked and measured on the 8th of November.

Produce of the row that had not been topped and stripped, nine bushels and five-eights of corn in the ear.

One of the rows which had been topped and stripped, measured seven bushels and six-eighths; and the other topped and stripped row measured seven bushels and three-eights of corn in the ear.

Thus it clearly appears that mutilating the corn plant before its fruit is perfected, is a very injurious practice. The injury done to my crop by this mode of management was clearly seen some time before the three experimental rows were cut off. Throughout the whole field the husks were generally dry and open, except on the row which had not been topped and stripped. On this, they still retained a greenish hue, and were close set to the ear when the plants were cut off by the roots.

In 1811 I selected three rows of maize in the middle of my field, as nearly alike as possible. The plants were then about two feet high. I cut off the tops of the middle row as low down as might be readily done without injuring the tassels, which were wrapped in their own leaves within the stalks. I could not observe that the stalks in the row which had been cut, grew any thicker, until new leaves had been formed from the crown of the plants. Before this happened, the stalks in the rows on either side of it, seemed to be as thick again as those standing in it; and the ears grown on the plants in this row, shot, filled, and ripened, about two weeks later than the rest of the field.

As several writers on agriculture had asserted that the tops of potatoes might be cut and given to the cattle, without injury to the crop, I cut off the tops from a row running through the middle of a very luxuriant patch. Care was taken to cut them in that way which was supposed least likely to prove injurious to the future growth of the plants. The debilitated appearance of the second growth of the tops, determined me not to risk a second cutting of them. When the crop was gathered, the roots in the row that had been cut did not seem to be more than half as large as those in the rest of the patch.

In fact, I have never seen any advantage arise, either from carefully trimming, or ruggedly mutilating annual plants; on the contrary, much injury certainly follows. It is, however, probable, that good housewives and ignorant gardeners will continue to tread and mutilate the tops of their onions, as long as the world may happen to last, for the express purpose of making the roots grow much more luxuriantly; unless, perchance, they may happen to reflect, that the tops would not have existed, if nature did not consider them as necessary to the well being of the plant as its roots. Certain it is, that the writings of many gentlemen, who ought to have known better, are exactly calculated to confirm them in this truly savage practice. —*Lorain.*

IMPORTANCE OF MANURE BEING FERMENTED IN THE SOIL.

Some cultivators, in order to make the soil open and mellow, turn it from the plants into the first cultivation, but after harrowing well, turn it immediately back to them, least injury might be done by leaving the roots exposed. This is a more rational practice than either of those just mentioned, but it is laborious and also imposing. The open texture of the soil is obtained at the expense of the roots of the plant and the useless waste of the animal and vegetable matter contained in it. As fermentation is greatly checked by this practice, the soil (unless it be sandy or very rich,) settles, and becomes harder than it would have been if the grounds had not been so carefully pulverized; especially if heavy rains follow this inconsiderate and laborious practice.

It should, however, be recollected, that the powerfully expanding force of fermentation cannot exist in a soil where perpetual ploughing and cropping has destroyed too much of the animal and vegetable matter that had formerly existed in it. In this case, a sufficiency of vegetation ought to be introduced, by red clover and the use of gypsum. Or if the grounds have been so often excited by that substance that it will no longer cause good crops of this grass to grow on them, without the aid of enriching manure, such other plants as

the soil will grow, should be cultivated and ploughed under for manure. When as much vegetation is procured from an exhausted soil as it is capable of producing, and also as much animal matter as may be obtained from the cattle grazed on it, and the animalcula which are fed and sheltered by it, the next thing to be considered is, how this scanty product may be most advantageously used, and with the least possible expense. The quantity of inert earth is often very great in proportion to the animal and vegetable matter derived from the green crop grown on it: therefore but little comparative good is to be expected, unless this manure be so applied and ordered, that the whole expanding force and enriching matter contained in it, be expanded within the soil to the best advantage. However, if this be done, the benefit derived from it will be found much greater than has been commonly obtained from ploughing green crops under the soil, for the growth of fallow crops.

To illustrate this, I will again refer to buckwheat. That plant is too often threshed on the field where it grew, and the straw left in large heaps to perish, with but little ultimate use to the cultivator. We may observe, after the straw has been decomposed, that the remaining matter is very little, when compared with the original bulk of the heaps. This, together with the evident texture of the straw, seems to determine that water forms a very considerable proportion of the plant. It of consequence contains much less nutritive matter, than most of the plants ploughed under the soil for manure. It has however notwithstanding this, been ploughed under with very great success, for a wheat crop; especially in England. Now we all know, that although the wheat will stubble, fall, and become unproductive, when too much manure is applied for the crops, still much nutriment is required to grow a good crop of that grain. Why then does a crop of buckwheat, ploughed under the soil, supply sufficient nutriment to effect this purpose, when it clearly appears to furnish but little nutritive matter for the growth of plants? The reason is obvious, and the principle highly important to the interests of agriculture, if farmers would make a general application of it. After the buckwheat is ploughed under the soil, it remains undisturbed by folly, and the injurious and very expensive labor too generally used when fallow crops are cultivated: consequently, fermentation keeps the soil open and mellow for the roots of the plants, and decomposition supplies them with nutriment. As none of the enriching and fertilizing matter, arising from the decomposition of the green crop, is uselessly wasted in the way that has been described, the product is as abundant as could be rationally expected from the properties of the manure. It therefore seems, that quite as much, (if not more) depends on the proper use of manure, as on the quality or quantity applied; especially as we all know that a clover lay is an excellent preparation for wheat. If the ground be well stored with the roots of this plant, the crop seldom fails to be productive, even when the soil is thin, provided the seed for the grain crop be sown on one ploughing. On the contrary, if the lay be prepared by repeated ploughings, the crop is seldom good, unless the soil be rich enough to supply the great loss sustained in consequence of exposing the enriching and fertilizing matter contained in the clover roots to useless waste. The fact has been often and well confirmed, by sowing one part of the same clover lay on one ploughing, and the other part after the grounds had been oftener ploughed. Although the cause of this marked difference ought to be known, it certainly has not been sufficiently considered: especially in the different application of clover and other grass lays, or a more general and far better application and cultivation of them would have been adopted. Gypsum, even when the soil is very thin, causes the clover to grow luxuriantly. The tops we know to be very nutritive, and have every reason to believe that the roots are not less so, as far as the food for plants may be concerned. When the clover has not been injured by being too frequently mown or closely pastured, the interior of the soil is well filled with roots, and the surface of the ground is as regularly covered with the tops of the plant. As it cannot (like the spear grasses,) live after its roots have been reversed by the plough, a general fermentation quickly takes place; and this is not checked when small grain is sown on one ploughing, the crop is generally as good as might be expected from this judicious and of course rational practice.

Why then should we spend so much money in useless and very injurious labor, when it is evident, so far as the practice has been generally tried, that if we place the necessary materials properly within the soil, and subdue the grasses and weeds on the surface of it, by the very easy and effectual means that have been described, nature will keep the interior of the soil more open and mellow, for the growth of the plants than can be done by us with the plough? It should be also recollected, that by the use of this instrument, we cut and rend the roots of the plants, and by turning up the nutritive matter, expose it to much useless waste.—*Lorain.*

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

As the prices at which Mr Colling's stock sold affords the best criterion of its value, and as the names of the animals may be considered as constituting a sort of *Herd Book*, by which the pedigree of individuals may be appreciated, we give the catalogue of the sale entire, omitting only the names of the purchasers. The sale took place October 11, 1810:

COWS.

Names.	*Out of*	*Got by*	*Age.*	*Bulled by*	*Sold for £*
Cherry	Old Cherry	Favorite	11	Comet	83
Kate		Comet	4	Mayduke	35
Peeress	Cherry	Favorite	5	Comet	170
Countess	Lady	Cupid	9	do	400
Celina	Countess	Favorite	5	Petrarch	200
Johanna	Johanna	do	4	do	130
Lady	Old Phoenix	A grandson of Lord Bolingbroke	14	Comet	206
Catheline	A daughter of the dam of Phoenix	Washington	8	Comet	170
Laura	Lady	Favorite	4	do	210
Lily	Daisy	Comet	3	Mayduke	410
Daisy	Old Daisy	A grandson of Favorite	6	Comet	140
Cora	Countess	Favorite	4	Petrarch	70
Beauty	Miss Washington	Marsh	4	Comet	120
Red Rose	Eliza	Comet	4	Mayduke	45
Flora		do	3	do	70
Miss Peggy		A son of Favorite	3	Comet	60
Magdalene	A heifer by Washington	Comet	3	do	170

BULLS.

Names.	*Out of*	*Got by*	*Age.*	*Gu.*
Comet	Phoenix	Favorite	6	1000
Yarborough		Favorite	9	55
Major	Lady	Comet	3	200
Mayduke	Cherry	do	3	145
Petrarch	Old Venus	do	2	365
Northumberland		Favorite	2	80
Alfred	Venus	Comet	1	110
Duke	Dutchess	do	1	105
Alexander	Cora	do	1	63
Ossian	Magdalene	Favorite	1	76
Harold	Red Rose	Windson	1	50

BULL CALVES—*Under one year old.*

Names.	*Out of*	*Got by*	*Gu.*
Ketton	Cherry	Comet	50
Young Favorite	Countess	do	140
Geerse	Lady	do	130
Sir Dimple	Daisy	do	90
Narcissus	Flora	do	15
Albion	Beauty	do	60
Cecil	Peeress	do	170

HEIFERS.

Names.	*Out of*	*Got by*	*Age.*	*Gu.*
Phoebe	Dam of Favorite	Comet	3	105
Young Dutchess	do	do	2	183
Young Laura	Laura	do	2	101
Young Countess	Countess	do	2	206
Lucy	Dam of Washington	do	2	132
Charlotte	Catheline	do	1	136
Johanna	Johanna	do	1	35

HEIFER CALVES—*Under one year old.*

Names.	*Out of*	*Got by*	*Gu.*
Lucilla	Laura	Comet	106
Calista	Cora	do	50
White Rose	Lily	Yarboro'	75
Ruby	Red Rose	do	50
Cowslip		Comet	25

Thus it would seem that the *true* improved Short Horns are a cross of the large Teeswater with the smaller Galloway breeds made by Mr. C. Colling, and the pedigree of these animals is traced back by the breeders to some one of the animals named in the preceding list. Robert, as well as Charles Colling, was an early breeder of this improved stock. His stock was sold in 1818, when the following great prices was obtained for some of his cattle, a sufficient proof of the estimation in which they were held;

One 2 year old cow, sold for 331 guineas.
One 4 year old cow,...do...300 do
One 5 year old cow,...do...370 do
One 1 year old bull calf,do...270 do
One 4 year old bull,...do...621 do

It appears by the catalouge, with printed prices affixed, that
34 cows....sold for....4,141 guineas.
14 heifers....do.....1,287 do
6 bulls.....do.....1,343 do
4 bull calves,do..... 713 do

61 head of cattle do....7,484 do

The great improvement effected by the Messrs. Colling, was the symmetry of form, and the disposition to feed rapidly. Every perfection in cattle, whether it be one of form, of quality of flesh, or disposition to fatten, or to yield milk—can be retained only by the breeder's devoted attention to this particular object; and every advance towards one point has been tantamount to receding from another; because the same proceeding which tends to enhance a particular quality, will also enhance a defect, provided such defect was of previous existence. It is admitted that the improved breeds do not give such a *quantity* of milk as the unimproved, or Holderness; yet it is maintained that the milk of the former is better quality, and yields as much *butter*. Col. Powell, of Philadelphia, obtained from an improved Short Horn, at the rate of 20 lbs. of butter per week, though undoubtedly under high keeping. It is contended that the cows unite the two qualities of taking flesh and giving milk to a degree of perfection, *but not at the same time;*—they succeed to each other, and at the period when it suits the dairy woman they should. It is well to remark, that the counties of Durham and York have been the principal theatre of Short Horn excellence, whether of old or new breeds. Hence the term of Yorkshire or Durham cattle is often applied to both.

[*From the Farmer and Gardener.*]

ART OF MANAGING SHEEP.

SIR—I have been very desirous of ascertaining the particular method in which Mr. Barney, of Philadelphia, manages his sheep, that enables him so far to exceed every body else in producing fine mutton and good wool.

On his late visit to this city, I put the question to him, wherein consisted his superior management of sheep? He gave the following reply: He said a gentlemen visited him not long since, and on going to his sheep-yard, and viewing it, asked him the same question. He showed at that time, from fifty ewes, upwards of sixty lambs, all lively and brisk, with a loss, I think he said, of three or four. The gentlemen observed to him that he had his shed covered with dead lambs; and asked wherein the secret in breeding lay.—Mr. Barney observed to him, you stuff your sheep with dry food.—Yes, as much good clover hay as they will eat, was the reply. Mr. B.—You give them no water, but suffer them to go out in time of snow and eat it as they are disposed to do? Yes. Then, said Mr. Barney, there lies the secret. Your sheep fill themselves with dry hay; they get no water; and they have not a sufficient supply of gastric juice to promote the digestion of the hay in the stomach; they cannot raise it to *chew the cud;* they lose their appetites; are thrown into a fever; and cannot bring forth their young, or they bring forth a feeble, starved lamb, that falls off and dies the first exposure to the cold or rain. On the contrary, I take care to provide my sheep with good clear water in summer and winter. I feed them regularly with hay through the winter, and give them ruta baga and mangel wurtzel every day. The ewes produce me 120 per cent, increase in lambs. You cannot, says Mr. Barney, get along without ruta baga and mangel wurtzel.

This gentlemen has just sold his sheep for upwards of $17 per head to the butchers. It is his opinion that sheep are the most profitable stock that a man can raise; and it appears he makes use of no expensive food, or increased quantity of it. But the secret of raising good stock of every kind, consists in maintaining that regular and cleanly mode of proceeding, which preserves the digestive organs of the animal in a healthy state, and enables them to convert what they eat into chyle, suitable for the nourishment of the animal.

Respectfully yours, A.

[*From the Quebec Mercury.*]

A paragraph lately appeared in this paper, stating that the Lower Canada Society for the Promotion of Agriculture had received answers to certain queries proposed by them, on matters connected with cattle, to the Right Hon. Sir John Sinclair, Bart.; Wm. Aiton, Esq.; Charles Gordon, Esq. Secretary to the Highland Society, and Wm. Hamilton, Esq. Secretary to the Botanical and Horticultural Society of Plymouth. We have been favored with the answers of these gentlemen for publication; they are given below, and will be found to convey very much useful information, communicated with a readiness and in a manner to afford ample proof of the ability and willingness of these distinguished characters to promote the extension of agricultural knowledge, by every assistance they can render.

Sir John Sinclair and Mr. Aiton accompanied their answers with copies of their respective works on agriculture, which are of great value; and Mr. Hamilton rendered his letter doubly acceptable by conveying, at the same time, a further supply of the Victoria or Carraccas Wheat. The communications of these gentlemen follow [in part]:

Answers to queries put by the Agricultural Society of Lower Canada, at Quebec, to the Right Hon. Sir John Sinclair, Bart.

Query 1.—What, in your opinion, is the most celebrated breed of milch cows in Great Britain?

Answer.—The improved dairy cows in the western counties of Scotland are certainly, now, the most celebrated and valuable breed of milch cows in Great Britain, or any other part of Europe. Such is the opinion of one who has carefully inspected all the different breeds of cattle in Scotland, in many of the counties of England, as well as on the continent, from Paris to the Texel. The cows in Cheshire are not of a uniform breed, but a mixture of those in the neighboring counties, and of Scotch and Irish breeds, all crossed and blended together. And as they are not so well fed and treated as the dairy stock in Scotland, they are inferior to them in general character, and in milking. The Durham or Teeswater breed are superior, as dairy cows, to any other breed in England; and if they were as well fed and treated as the Scots dairy stock, they would equal them in beauty and good qualities. The cattle in Holland have often been mentioned as excellent dairy cows, but from the quality of their pasture, and the way they are fed in winter, the Dutch cows have strong bones, coarse shapes, and do not yield so much milk in proportion to their size, as the dairy cows in the western counties of Scotland. For the history, shapes and qualities of that breed, the Society are humbly referred to the account of the Dutch Dairy and Cattle Husbandry, in the tour through that country, sent with these answers.

Query 2.—What quantity of milk would a cow of such a breed give per day?

Answer.—There is such diversity in the quantity of milk, that some cows yield more than others of the same breed, and still more in what every cow will give under various changes of circumstances, that it is not easy to fix the proper average of the returns of any breeds. Cows sprung from the same parents, and reared and fed together, will often vary considerably in the quantity of milk they yield. Cows give less milk when young, or when they are too old, than they do from four to eight years of their age. Cows that are lean give less milk, and that of an inferior quality, than the same cows will give when they are in a good habit of body. Cows generally give more milk for two or three months after calving than they do afterwards. And the manner in which they are fed and treated has a powerful effect on the milking of cows.

But without going into particulars, or mentioning extraordinary

returns that some cows have made, it may be stated, with entire confidence, that the fair average of the annual returns of milk, given by thousands of the best of the Ayrshire dairy cows, when they are in good condition and well fed, and when they drop their calves about the end of the month of April, will be nearly as under.

First	50 days,	12 Scots pints per day	600
Second	50 days,	10 pints or 20 quarts	500
Third	do	7 pints per day	350
Fourth	do	4 do do	300
Fifth	do	4 do do	200
Sixth	do	4 do do	150
			2,000

Some of these cows give still greater returns, and very many that are of inferior sizes, or worse fed, do not give nearly so much milk as stated above. But the society may depend upon the fact, that all the proper dairy cows, when in good plight, and well supplied with proper food, will, in general, yield 2,000 Scots pints, or 4,000 quarts of milk every year. And it is equally certain, that 14 or 15 quarts of that milk will generally yield 22 or 23 ounces of butter; and that from 55 to 60 pints (110 or 120 quarts,) of that milk, with its cream, will yield twenty-four pounds avoirdupois of full milk cheese.

Query 3.—What would be the price of a cow of such a breed from two to three years old, and in calf?

Answer.—The prices of milch cows vary so much from diversity of circumstances that it is not easy to fix the price for any length of time. The scarcity of fodder from a very dry summer—the failure of pasture herbage from the same cause, or from the weather being cold and stormy in the months of May and June, which frequently happens in the changable climate of Scotland, will sometimes lower the price of milch cows, ten, twenty, or thirty per cent while a more favorable season will raise prices considerable. These cattle are twenty or thirty per cent cheaper in harvest than they are in May or June. The crops having been abundant, and the summers fine for three years past, the prices of milch cows are considerably higher than they have been for several years before.—Some milch cows of the best sort and in good condition, have been sold as high as £25: but young cows, from two to three years old and in calf, may be procured of the best sort, at from £10 to £12 each, or still cheaper.

Query 4.—What would be the price of a bull of the same breed, from eighteen months to two years old?

Answer.—Bulls also vary much in price. Some of the best dairy bulls have been sold as high as from £150 to £200: while one of an ordinary description may frequently be procured for £9 or £12. It would be proper to select a bull for Canada about two years old, as the best looking calves frequently alter so much in their shapes and character before they come to maturity, as to render it unsafe to trust to what they may turn out, until they are two years old. The dairy bulls, that have most of a feminine aspect, are preferred to those that are more masculine. A dairy bull of good shape and qualities may be procured for about £14 or 16.

Query 5.—What is the most celebrated breed of cows in Great Britain or elsewhere, for the production of butter?

Answer.—The quantity of butter yielded by cows, depends more on the food given them, than on any peculiarity of the breed of cattle; and the quality of the butter is greatly influenced by the mode of feeding, and still more by the manner in which the butter is manufactured. Cows that browze on natural pasture, or what is called old turf, do not yield so much milk as the same cows would give when fed on clover, turnips, cabbages, and new herbage, but the milk of the former is of better quality, and yields more and richer butter, from any given quantity of milk, than that of cows fed on clover, &c. Some individual cows of every breed give richer milk, and of course more butter in proportion to their milk, than other cows of the same breed, and when reared and fed in the same manner. Milk, as it comes from the cows, consists of oily matter, from which butter is made, *lactic* matter, which forms cheese, and *serium* or whey: and the milk of particular cows of every breed differs considerably in the proportions it contains of these respective substances. But it is doubtful if any particular breed can be pointed out, which uniformly yield more butter than any of the other breeds except in so far as they yield more milk, or are influenced by climate, the mode of feeding, &c. Much butter, and that of a superior quality, is made in Holland, and particularly in the Province of Freiseland. This seems to proceed from the cattle being fed on meadows where the herbage is of natural growth, and very rich.—The cows in Holland give less milk in proportion to their size, than the generality of the Scots dairy cows; but the milk of the Dutch cows is richer than the other. In Holland the milk is not allowed to stand more than from 18 to 24 hours, to cast up cream, while in Scotland it stands double those periods. The consequence is, that nothing but the richest and best cream, which always rises first, is made into butter in Holland; while in Scotland, the inferior cream, which makes inferior butter, is collected and churned with the other. And, above all things, the great attention paid to cleanliness in Holland has a powerful effect on the quality of their butter.

Query 6.—What quantity of butter would a cow of such breed produce per week?

Answer.—From what has been already stated as to the diversity of the quality and quantity of milk, the society will readily perceive that it is not easy to answer this query on general principles: A cow, kept by William Cramp, of Lewis, in the county of Sussex, is mentioned in the fifth and sixth volumes of the communications to the Board of Agriculture, as having yielded, in the year 1805, 540 pounds advoirdupois of butter. In 1806, this cow gave 450 pounds of butter, in 1807, she gave 675 pounds, and in 1808, the same cow gave 466 pounds, avoirdupois of butter. The Secretary to the Board of Agriculture mentioned a cow kept by the Reverend Mr. Heckett, of Beckingham, near Newark, that yielded nineteen pounds, avoirdupois, of butter in one week. But he added, that six, seven, or eight pounds per week, were the common returns of the cows in that part of England. Mr. Vancouver states, in his report of Hampshire, that a cow of an inferior size, kept by Anthony Grave, Symington, yielded from fifteen to sixteen pounds, avoirdupois, of butter, per week, for some part of the season. A cow of the Ayrshire dairy breed, kept by Mr. White, on land in Lanarkshire, situated in 800 feet of altitude above the level of the sea, yielded, for several weeks in summer, 1833, sixteen pounds, avoirdupois, of butter per week. And the Rev. Mr. Alpin, of Skarling, obtained at the rate of thirteen pounds of butter from one of his cows that year per week.

But although many such instances of produce could be pointed out, they are far above the ordinary or medium returns of dairy cows. It is certain, however, that thousands of the Scots dairy cows yield 4,000 quarts of milk in the course of one year, as has been mentioned; and it is equally certain that sixteen quarts of that milk uniformly yield, on an average, 24 ounces of butter so that the average return of these cows, when of good quality, in right condition and properly fed, is 375 pounds, avoirdupois of butter, per cow, per annum.

Science of Agriculture.

OF THE DIFFERENT SPECIES OF MINERAL MANURES.

Alkaline earths, or alkalis, and their combinations, which are found unmixed with the remains of any organized beings, are the only substances which can with propriety be called fossil manures. The only alkaline earths which have hitherto been applied in this way, are lime and magnesia; though potassa and soda, the two fixed alkalis, are both used to a limited extent in certain of their chemical compounds.

The most common form in which lime is found, on the surface of the earth, is in a state of combination with carbonic acid or fixed air. If a piece of limestone or chalk be thrown into a fluid acid, there will be an effervescence. This is owing to the escape of the carbonic acid gas. The lime becomes dissolved in the liquor.—When limestone is strongly heated, the carbonic acid gas is expelled, and then nothing remains but the pure alkaline earth; in this case there is a loss of weight; and if the fire has been very high, it approaches to one half the weight of the stone; but in common cases, limestones, if well dried before burning, do not lose much more than 35 or 40 per cent, or from seven to eight parts out of twenty.

When burnt lime is exposed to the atmosphere, in a certain time it becomes mild, and is the same substance as that precepitated from lime water; it is combined with carbonic acid gas. Quick-lime, when first made, is caustic and burning to the tongue, renders vegetable blues green, and is soluble, [i. e. dissolves,] in water; but when combined with carbonic acid, it loses all these properties, its solubility, and its taste; it regains its power of effervescing, and

becomes the same chemical substance as chalk or limestone. Very few limestones or chalks consist entirely of lime and carbonic acid. The statutary marbles, or certain of the rhomboidal spars, are almost the only pure species; and the different properties of limestones both as manures and cements, depend upon the nature of the ingredient mixed with the limestone; for the true calcareous element, the carbonate of lime, is uniformly the same in nature, in properties, and effects, and consists of one proportion of carbonic acid, 41.4, and one of lime, 55. When a limestone does not copiously effervesce in acids, and is sufficiently hard to scratch glass, it contains silicious, [sandy,] and probably aluminous, [clayey,] earths. When it is deep brown or red, or strongly coloured of any of the shades of brown or yellow, it contains oxide of iron. When it is not sufficiently hard to scratch glass, but effervesces slowly, and makes the acid in which it effervesces milky, it contains magnesia. And when it is black, and emits a fœtid smell if rubbed, it contains coaly or bituminous matter. Before any opinion can be formed of the manner in which the different ingredients in limestones modify their properties, it will be necessary to consider the operation of pure lime as a manure.

Quick-lime, in its pure state, whether in powder or dissolved in water is injurious to plants. In several instances grass has been killed by watering it with lime-water. But lime, in its state of combination with carbonic acid, is a useful ingredient in soils. Calcareous earth is found in the ashes of the greater number of plants; and exposed to the air, lime cannot long continue caustic, for the reasons that were just now assinged, but soon becomes united to carbonic acid. When newly burnt lime is exposed to air, it soon falls into powder; in this case it is called slaked lime; and the same effect is immediately produced by throwing water upon it, when it heats violently, and the water disappears. Slaked lime is merely a combination of lime, with about one-third its weight of water; i. e. fifty-five parts of lime absorb seventeen parts of water, and is called by chemists *hydrate of lime;* and when hydrate of lime becomes carbonate of lime by long exposure to air, the water is expelled, and the carbonic acid gas takes its place. When lime, whether freshly burnt or slaked, is mixed with any moist, fibrous, vegetable matter, there is a strong action between the lime and the vegetable matter, and they form a kind of compost together, of which a part is usually soluble in water. By this sort of operation, lime renders matter which was before comparatively inert, nutritive; and as charcoal and oxygen abound in all vegetable matters, it becomes at the same time converted into carbonate of lime.

Mild lime, powdered lime-stone, marls or chalks, have no action of this kind upon vegetable matter; they prevent the too rapid decomposition of substances already dissolved, but they have no tendency to form soluble matters. It is obvious from these circumstances, that the operation of quick-lime, and marl or chalk, depends upon principles altogether different. Quick-lime in being applied to land, tends to bring any hard vegetable matter that it contanis into a state of more rapid decomposition and solution, so as to render it a proper food for plants. Chalk, and marl, or carbonate of lime, will only improve the texture of the soil, or its relation to absorption; it acts merely as one of its earthy ingredients. Chalk has been recommended as a substance calculated to correct the sourness of land. It would surely have been a wise practice to have previously ascertained the certainty of this existence of acid, and to have determined its nature, in order that it might be effectually removed. The fact really is, that no soil was ever yet found to contain any notable quantity of uncombined acid. The acetic and carbonic acids are the only two that are likely to be generated by any spontaneous decomposition of animal or vegetable bodies, and neither of these have any fixity when exposed to the air. Chalk having no power of acting on animal or vegetable substances, can be no otherwise seviceable to land than as it alters its texture. Quick-lime, when it becomes mild, operates in the same manner as chalk, but in the act of becoming mild, it prepares soluble out of unsoluble matter. Bouillon La Grange says, that gelatine oxygenized becomes insoluble, and vegetable extract becomes so from the same cause; now lime has the property of attracting oxygen, and, consequently, of restoring the property of solubility to those substances, which have been deprived of it, from a combination of oxygen.—Hence the use of lime on peat lands, and on all soils containing an excess of vegetable insoluble matter.—*Grisenthwaite.*

Effect of lime on wheat crops.—When lime is employed upon land where there is present any quantity of animal matter, it occasions the evolution of a quantity of ammonia, which may, perhaps, be imbibed by the leaves of plants, and afterwards undergo some change so as to form gluten. It is upon this circumstance, that the operation of lime in the preparation for wheat crops depends; and its efficacy in fertilizing peat, and in bringing into a state of cultivation all soils abounding in hard roots, or dry fibres, or inert vegetable matter.

General principles for applying lime.—The solution of the question whether quick lime ought to be applied to a soil, depends upon the quantity of inert vegetable matter that it contains. The solution of the question, whether marl, mild lime, or powdered limestone ought to be applied,depends upon the quantity of calcareous matter already in the soil All soils are improved by mild lime, and ultimately by quick-lime, which do not effervesce with acids, and sands more than clays. When a soil, deficient in calcareous matter, contains more soluble vegetable manure, the application of quick-lime should always be avoided, as it either tends to decompose the soluble matters by uniting to their carbon and oxygen so as to become mild lime, or it combines with the soluble matters and forms compounds having less attraction for water than the pure vegetable substance. The case is the same with respect to most animal manures, but the operation of the lime is different in different cases; and depends upon the nature of the animal matter. Lime forms a kind of insoluble soap with oily matters, and then gradually decomposes them by separating from them oxygen and carbon. It combines likewise with the animal acids, and probably assists their decomposition by abstracting carbonaceous matter from them combined with oxygen; and consequently must render them less nutritive. It tends to diminish, likewise, the nutritive power of albumen from the same causes; and always destroys, to acertain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them new arrangements. Lime should never be applied with animal manures, unless they are too rich, or for the purpose of preventing noxious effluvia. It is injurious when mixed with any common dung, and tends to render the attractive matter insoluble. According to Chaptal, lime forms insoluble composts, with almost all animal or vegetable substances that are soft, and thus destroys their fermentative properties. Such compounds, however, exposed to the continued action of the air, alter in course of time, the lime becomes carbonate, the animal or vegetable matter decompose, by degrees, and furnish new products as vegetable nourishment. In this view, lime presents two great advantages for the nutrition of plants; the first, that of disposing of certain insoluble bodies to form soluble compounds, the second, that of prolonging the action and nutritive qualities of substances, beyond the term which they would retain them if they were not made to enter into combination with lime. Thus the nutritive qualities of blood, as it exists in the compound of lime and blood, known as sugar bakers' scum, is moderated, prolonged, and given out by degrees;—blood alone applied directly to the roots of plants will destroy them, with few or no exceptions.

Lime promotes fermentation.—In those cases in which fermentation is useful to produce nutriment from vegetable substances, lime is always efficacious. Some moist tanner's bark was mixed with one-fifth of its weight of quick-lime, and suffered to remain together in a close vessel for three months; the lime had become coloured and was effervescent; when water was poured upon the mixture, it gained a tint of fawn colour, and by evaporation furnished a fawn coloured powder, which must have consisted of lime united to vegetable matter, for it burnt when strongly heated, and left a residuum of mild lime.—*Loudon's Enc. Ag.*

GYPSUM.

Besides being used in the forms of lime and carbonate of lime, calcareous matter is applied for the purposes of agriculture in other combinations. One of these bodies is gypsum or sulphate of lime. This substance consists of sulphuric acid, the same body that exists combined with water in oil of vitriol, and lime, and when dry is composed of 55 parts of lime and 75 parts of sulphuric acid. Common gypsum or selenite, such as that found at Shotoverhill, near Oxford, contains, besides sulphuric acid and lime, a considerable quantity of water, and its composition may be thus expressed: sulphuric acid one proportion 75; lime one proportion 55; water two proportions 34.

The nature of Gypsum is easily demonstrated: if oil of vitriol be added to quick-lime, there is a violent heat produced; when the

mixture is ignited, water is given off, and gypsum alone is the result, if the acid has been used in sufficient quantity; and gypsum mixed with quick-lime, if the quantity has been deficient. Gypsum free from water, is sometimes found in nature, when it is called anhydrous selenite. It is distinguished from common gypsum by giving off no water when heated. When gypsum free from water, or deprived of water by heat, is made into a paste with water, it rapidly sets by combining with that fluid. Plaster of Paris is powdered dry gypsum, and its property as a cement, and its use in making casts, depends on its solidifying a certain quantity of water, and making with it a coherent mass. Gypsum is soluble in about 500 times its weight in cold water and is more soluble in hot water, so that when water has been boiled in contact with gypsum, crystals of this substance are deposited as the water cools. Gypsum is easily distinguished by its properties of affording precipitates to solutions of oxalates and barytic salts. It has been much used in America, where it was first introduced by Franklin on his return from Paris, who had been much struck with its effects there. He sowed the words, *this has been sowed with gypsum*, on a field of lucern, near Washington; the effects astonished every passenger, and the use of the manure quickly became general, and signally efficacious. It has been advantageously used in Kent, but in most counties of England it has failed, though tried in various ways, and upon different crops.

Very discordant notions have been formed as to the mode of operation of gypsum. It has been supposed by some persons to act by its power of attracting moisture from the air; but this agency must be comparatively insignificant. When combined with water, it retains that fluid too powerfully to yield it to the roots of the plant, and its adhesive attraction for moisture is inconsiderable, the small quantity in which it is used likewise is a circumstance hostile to this idea. It has been erroneously said that gypsum assists the putrefaction of animal substances, and the decomposition of manure.

The ashes of saintfoin, clover and rye-grass afford considerable quantities of gypsum; and the substance is intimately combined as a necessary part of their woody fibre. If this be allowed, it is easy to explain the reason why it operates in such small quantities; for the whole of a clover crop, or saintfoin crop, on an acre, according to estimation, would afford by incineration only three or four bushels of gypsum. The reason why gypsum is not generally efficacious, is probably because most cultivated soils contain it in sufficient quantities for the use of the grasses. In the common course of cultivation, gypsum is furnished in the manure, for it is contained in stable dung, and in the dung of all cattle fed on grass, and it is not taken up in corn crops, or crops of peas and beans, and in very small quantities in turnip crops; but where lands are exclusively devoted to pasturage and hay, it will be continually consumed. Should these statements be confirmed by future inquiries, a practical inference of some value may be derived from them. It is possible that lands that have ceased to bear good crops of clover, or artificial grasses, may be restored by being manured with gypsum.

Dairy Husbandry.

The practice of the Dutch in Holland, and of the Germans in Pennsylvania, of cooling their milk immediately after it is drawn from the cow, is calculated to abridge the labor of the dairy, and to improve its products. During the hot weather of summer, milk becomes lobbered in 24 hours after it has been drawn, and before the whole of the cream has risen to the surface; *after which no more cream rises.* By reducing the temperature, nearly all the cream rises in 24 hours, and the lobbering of the milk is considerably retarded. In Pennsylvania, milk-houses of stone or brick, built over springs are common. In these the milk is kept in a temperature of 50 to 55 degrees, although the exterior heat may be 90. When springs are not convenient, milk cellars are constructed under ground, and water to reduce and keep down the temperature supplied by pumps. In Holland, where springs do not abound, every dairy is provided with a water tight pit, termed a *koelbak*, built of brick or stone; they are about six feet in length, three feet in breadth, and two in depth. These are filled with water by a pump, which is generally seen at one end, and the fresh drawn milk, in brass pitchers made for the purpose, is deposited in it for two hours, and frequently stirred. This cooling process is found of great advantage in causing the cream to separate rapidly and abundantly from the milk. The milk is then strained, placed in shallow pans, and remains in the milk cellar, which adjoins, and is sunk a few steps below the *koelbak*, where it remains for 24 hours, and is then skimmed.—*Cultivator.*

ON THE DAIRY HUSBANDRY OF HOLLAND.

The Highland Society of Scotland, considering the advantages that might be derived from an acquaintance with the modes of managing dairies in Holland, offered, in 1831, a premium for the best report upon that subject, founded on personal observation. The premium was subsequently awarded to John Mitchell, whose report was published in 1833. We abstract from this report, such facts as are likely most to interest our dairy farmers, and lead to their improvement. We will barely premise, that the products of the Dutch dairy, particularly the butter, are in higher demand than those of any other country. Vast quantities of butter are annually exported to Britain, the West Indies, &c. 116233 cwt. of butter, and 167,913 cwt. of cheese, were brought from Holland to England, in 1830. Were the same care taken in manufacturing our butter which is bestowed in Holland, we should find a brisk foreign demand for all our surplus stock. But at present our butter is inferior, will not bear transportation to a warm climate, and will not compete with that of Holland.

Pasture.—The pastures in Holland have been reclaimed from the ocean. They are flat, low and moist, the water in the small canals or dykes always rising nearly to their surface. They are of course permanent, or are seldom broken with the plough. They are top dressed every third year with cow-house manure, mixed with the scrapings of the small canals, and the first year after dressing, reserved, generally, for hay.

Supposing the whole growth 700, the Dutch farmers consider that there grows, for the consumption of the cow, from the beginning of spring till May, 135 parts; in June, 20; July, 135; August, 95; September, 55; October till winter, 80.

Cows are particularly selected for the dairy. Their price is about 9 or £10 ster.—40 to $45. They are generally fattened and turned off to the butcher at eight years old, and bulls at four or five. The cows are turned to pasture in March or April, and are at first covered with a very thick cloth of tow, covering the upper half of the body from the shoulders to the tail, to prevent diseases from cold. They are pastured about 30 weeks. Hay is their common food in winter, though rape cake and brewers' grains are sometimes added. The byres or cow-houses are generally lofty, airy, paved with large square bricks, and kept perfectly clean. The roof is about 10 feet high. There are no racks or mangers, but the food placed in gutters, always clean, near their heads. Gutters in their rear, serve to carry off the urine and dung, and these gutters are also kept clean.

Process of manufacture.—The cows are always milked by the men, and the butter and cheese made by the women, generally of the family. Ninety cows are managed by nine men, and two women. There is generally one man required to ten cows; while two women are considered enough for any dairy. The farmer reckons that he can make 100 guilders, about 40 dollars, per annum, by each cow.

Butter.—There are three distinct kinds of butter made in Holland; *Grass butter*, made when the cows are at grass; *Whey butter*, from the whey of sweet milk cheese; and *Hay butter*, made in winter.

Grass butter.—The cows being carefully milked to the last drop, the pitchers containing the milk, are put into the *Koelbak*, a description of which will be found in the preceding article. When the cream has been gathered and is soured, and if there is a sufficient quantity from the number of cows, they churn every 24 hours, the churn being half filled with the soured cream. A little *boiled* warm water is added in winter, to give the whole the proper degree of heat, and in very warm weather, the milk is first cooled in the *koelbak* or cooler. In small dairies, the milk is sometimes churned, when soured, without separating the cream. The butter, immediately after being taken out of the churn, is put into a shallow tub, called a *vloot*, and carefully washed with pure cold water. It is then worked with a slight sprinkling of fine salt, whether for immediate use or the barrel. When the cows have been three weeks at grass, the butter is delicious, is made in fanciful shapes of lambs, stuck with the flowers of the polyanthus, pyramids, &c. and sells as high as 44 stivers, 60 to 70 cents, the 17 oz. or Dutch pound. If intended for barrelling, the butter is worked up twice or thrice a day, with soft fine salt, for three days, in a flat tub, there being about two pounds of this salt

allowed for fourteen pounds of butter; the butter is then hard packed by thin layers into casks, which casks are previously carefully seasoned and cleaned. They are always of oak, well smoothed inside. Before being used, they are allowed to stand three or four days, filled with sour whey, and thereafter carefully washed out and dried. Each cow, after being sometime at grass, yields about one Dutch pound (17½ oz.) butter per day.

We beg our dairy women to mark two points in the preceding process. 1. *No salt is used but what is incorporated with and dissolved in the butter, and which is necessary to give it flavor;* and 2, *the butter* intended for keeping *is worked from six to ten times*, to incorporate the salt, and *to separate from it every particle of liquid*, which, if left in it, would induce rancidity.

Hay butter undergoes a like process.

Whey butter.—The whey is allowed to stand three days or a week, after being separated from the curd, when the cream is skimmed off, or the whey itself put into the churn, and the butter is formed in about an hour. By this process, in winter one pound of butter is obtained from each cow in a week, and in summer 1½ pounds. The relative prices are generally, grass butter 8½ stivers, hay butter 7, and whey butter 6.

Cheese.—There are four kinds of staple chese made in Holland, —the *Edam* and *Gouda*, both made from unskimmed milk; and two kinds, called *Kanter Cheese*, made from milk once and twice skimmed.

Edam Cheese.—The process of manufacture of the Edam Cheese is as follows:

The milk being yearned as soon as taken from the cow, when coagulated, the hand, or a wooden bowl, is passed gently two or three times through the curds, which are then allowed to stand a few minutes; the bowl or finger is again passed through them, and they stand a few minutes. The whey is then taken off with the wooden bowl, and the curd is then put into a wooden form, (of the proper size and shape of the cheese to be made.) This form is cut out of the solid wood by a turner, and has one hole in the bottom. If the cheese is of the small size, (about 4 lbs.) it remains in this form about ten or twelve days; if the large sized, it remains about fourteen days. It is turned daily, the upper part during this time being kept sprinkled with about two ounces of purified salt of the large crystals. It is then removed into a second box or form of the same size, with four holes in the bottom, and put under a press of about 50 lbs. weight, where it remains from two to three hours, if of the small size, and from four to six if of the large size. It is then taken out, and put on a dry airy shelf in the cheese apartment, and daily turned over for about four weeks, when they are generally fit to be taken to market.

Alkmaar, in North Holland, is the great market for Edam cheese. It is not uncommon to see 800 farmers at the market, and 470,000 cheeses for sale on one day. The price there averages about 30s. per cwt. ($6.66).—*Cultivator.*

Gouda Cheese.—This kind of cheese is also made from the milk immediately on its being taken from the cow. After gradually taking off the principal part of the whey, a little warm water is put upon the curd, which is left standing for a quarter of an hour. By increasing the heat and quantity of water, the cheese is made harder and more durable. All the whey and water is then taken off, and the curd is gradually packed hard into a form cut out by the turner, flatter and broader than the form for the Edam cheese. A wooden cover is placed over it, and the press, with a weight of about 8 lbs. put upon it. It is here frequently turned, and altogether remains under the press about 24 hours. The cheese is then carried to a cool cellar, put into a tub containing pickle, the liquid covering the lower half of it. The water for the pickle is boiled, and about three or four handfuls of salt melted in about thirty imperial pints of water. The cheese is not put in until the water is quite cold. After remaining twenty-four hours, or at most two days, in the pickle tub, where it is turned every six hours, the cheese, after being rubbed over with salt, is placed upon a board slightly hollowed, having a small channel in the centre, to conduct the whey which runs off into a tub placed at the one end. This board is called the *Zouttank*, upon which several cheeses are placed at a time. About two or three ounces of the large crystallized salt is placed upon the upper side of the cheese, which is frequently turned, the side uppermost being always sprinkled with salt. It remains on the zouttank about eight or ten days, according to the warmness of the weather; the cheese is then washed with hot water, rubbed dry and laid upon planks, and turned daily, until perfectly dry and hard.

The cheese house is generally shut during the day, but must be open in the evening and early in the morning.

Gouda is the principal market for this kind of cheese, where it sells at about 35s. per cwt.

Each cow at grass in Holland is calculated to give about three or four pounds sweet milk cheese per day.

We omit the method of making the *Kanter Cheese*, which is similar to our skim-milk cheese—and of the cheese utensils.

The milk houses are generally between the dwelling and cow-house, in a square apartment, in a corner of which is the cooler; it is airy, roomy, and paved with square bricks—the upper part serving for churning, making cheese, &c. and descending a few steps, into a sort of cellar, is the milk-room, having two to four windows, which are opened or shut according to circumstances.

The cheese houses are also generally cellars, kept clean and well ventilated.

The Dutch are remarkably particular as to the quantity and quality of their salt, of which there are three kinds manufactured; and it is this, our reporter thinks, which is the principal cause of the sweet and delicious flavor of their butter, which, although well flavored, hardly tastes of salt, or rather of that acrid quality which is perceptible in the butter of Great Britain.

Cleanliness governs in all the Dutch dairies. Every dwelling-house is a model and a pattern. They seem to vie with each other on this point. The cow house is pure and clean, not a particle of filth being to be seen in it; the cows, says Mr. M. are as clean as if they were in a dining room; the milk and cheese houses, and in short every part of the house, are free from dust and dirt of any kind. The whole apartments, even the byre (stalls) and hay house are generally under one roof; and the cleanly system, and the admirable arrangement, give that comfort and pleasure which are too often wanted in other countries.

Household Affairs.

To have good yeast in summer, is a desirable object with every housewife. She may have such by the following simple process:

Boil a single handful of hops (which every farmer can and ought to raise, to the extent of household wants) in two or three quarts of water—strain and thicken the liquor, when hot, with rye flour; then add two or three small yeast or turnpike cakes, to set the mass. If this is done at evening, it will be fit for use early next morning. Reserve a pint of this yeast, which thicken with Indian meal, make into small cakes, the size of crackers, and dry them in the shade for future use. In this way the yeast is always fresh and active.—Yeast cakes kept a long time are apt to become rancid, and lose their virtues. The fresher the cakes the better the yeast.

Junket, is a term applied to a dish which every farmer's wife can readily make, and which constitutes an excellent light food for all classes during the heat of summer. It is merely milk curdled by the addition of a little rennet half an hour before dinner, and seasoned to the taste. First prepare your rennet for use, by cleaning, salting, stretching and drying the skin. When dry, cut into pieces as big as a dollar, and put them into brown sugar. When wanted for use, put one or two of the pieces into half a gill of cold water half an hour before wanted. Season the milk with sugar, nutmeg, and wine, if desired, then add the water in which the rennet has been soaked, stir the whole well, and in fifteen minutes it will be fit for use. Milk from two to four quarts.

To boil green corn.—Take it fresh from the stock, husk and put it into a kettle or pot of boiling water, and cover it well with the inner husks. Green corn soon grows vapid after it is picked and husked; the husks in the kettle preserve its fine fresh flavor.

To make a Minute Pudding.—Stir flour into boiling milk, to the consistence of a thin hasty pudding, and in fifteen or twenty minutes it will be fit for the table. Serve with sauce to suit the taste.

To make Currant Jelly.—Take the juice of red currants and white sugar, equal quantities in weight. Stir it gently and smoothly for three hours, put it into glasses, and in three days it will concrete into a firm jelly.

Young Men's Department.

THE PLEASURES OF SCIENCE

[*Continued from page* 45.]

In the third place, science contributes to our enjoyment *by the grand and sublime objects she presents before us.* In consequence of the investigations which have been made to determine the distances and magnitudes of the heavenly bodies, objects of magnificence and grandeur are now presented to the view of the enlightened mind of which former ages had no conception. These objects are magnificent in respect of *magnitude*, of *motion*, of *the vast spaces which intervene between them*, and *of the noble purposes for which they are destined.* What a sublime idea, for example, is presented to the view by such an object as the planet *Jupiter*,—a globe 1,400 times larger than the world in which we dwell, and whose surface would contain a population a hundred times more numerous than all the inhabitants that have existed on our globe since the creation! And how is the sublimity of such an idea augmented, when we consider that this immense body is revolving round its axis at the rate of twenty-eight thousand miles in an hour, and is flying, at the same time, through the regions of space, twenty-nine thousand miles every hour, carrying along with it four moons, each of them larger than the earth, during its whole course round the centre of its motion! And if this planet, which appears only like a luminous *speck* on the nocturnal sky presents such an august idea, when its magnitude and motions are investigated, what an astonishing idea is presented to the mind when it contemplates the size and splendor of the sun,—a body which would contain within its bowels, nine hundred globes larger than Jupiter, and thirteen hundred thousand globes of the bulk of the earth, which darts its rays in a few moments to the remotest bounds of the planetary system, producing light and colour, and life and vegetation throughout surrounding worlds! And how must our astonishment be still increased, when we consider the *number* of such globes which exist throghout the universe; that within the range of our telescopes more than eighty millions of globes, similar to the sun in size and in splendor, are arranged at immeasurable distances from each other, diffusing their radiance through the immensity of space, and enlivening surrounding worlds with their benign influence, besides the innumerable multitudes which, our reason tells us must exist beyond all that is visible to the eyes of mortals!

But the *motions*, no less than the magnitudes, of such bodies, present ideas of sublimity. That a globe* as large as the earth should fly through the celestial regions with a velocity of seventy-six thousand miles an hour,—that another globe† should move at the rate of one thousand seven hundred and fifty miles in a minute, and a hundred and five thousand miles in an hour,—that even Saturn, with all his assemblages of rings and moons, should be carried along his course with a velocity of twenty-two thousand miles an hour,—that some of the comets, when near the sun, should fly with the amazing velocity of eight hundred thousand miles an hour,—that, in all probability, the sun himself and all his attending planets, besides their own proper motions, are carried around some distant centre at the rate of more than sixty thousand miles every hour; and that thousands and millions of systems are moving in the same rapid manner, are facts so astonishing, and so far exceeding every thing we behold around us on the surface of the earth, that the imagination is overpowered and confounded at the idea of the astonishing forces which are in operation throughout the universe, and of the power and energy by which they are produced! and every rational being feels a sublime pleasure in the contemplation of such objects, which is altogether unknown to the ignorant mind.

The vast and *immeasurable spaces* which intervene between the great bodies of the universe, likewise convey august and sublime conceptions. Between the earth and the sun there intervenes a space so vast, that a cannon ball, flying with the velocity of five hundred miles an hour, would not reach that luminary in twenty years; and a mail-coach moving at its utmost speed, would not arrive at its surface in less than twelve hundred years; and, were it to proceed from the sun towards the planet Herschel, it would not arrive at that body till after the lapse of *twenty-two thousand years.* And yet the sun, at that immense distance, exerts his attractive energy, retains that huge planet in its orbit, and dispenses light and colour, life and animation, over every part of its surface. But all such spaces, vast as at first sight they appear, dwindle as it were into a span, when compared with those immeasurable spaces which are interposed between us and the regions of the stars. Between the earth and the nearest fixed star, a space intervenes so vast and incomprehensible, that a ball flying with the velocity above mentioned, would not pass through it in four millions and five hundred thousand years; and as there are stars, visible through telescopes, at least a hundred times further distant from our globe, it would require such a body four hundred millions of years, or a period 67,000 times greater than that which has elapsed since the Mosaic creation, before it could arrive at those distant regions of immensity.

The *grand and noble designs* for which the great bodies to which I have adverted are intended, suggest likewise a variety of interesting and sublime reflections. These designs undoubtedly are, to display the ineffable glories of the Eternal Mind,—to demonstrate the immensity, omnipotence and wisdom of Him who formed the universe,—and to serve as so many worlds for the residence of incalculable numbers of intelligent beings of every order. And what an immense variety of interesting objects is presented to the mind when its views are directed to the numerous orders and gradations of intelligence that may people the universe,—the magnificent scenes that may be displayed in every world,—the moral economy, and the important transactions that may have taken place in their history under the arrangements of the Divine government!

Such are some of the scenes of grandeur which science unfolds to every enlightened mind. The contemplation of such objects has an evident tendency to enlarge the capacity of the soul, to raise the affections above mean and grovelling pursuits, to give man a more impressive idea of the *dignity* of his rational and immortal nature, and of the attributes of that Almighty being by whom he is upheld, and to make him *rejoice* in the possession of faculties capable of being exercised on scenes and objects so magnificent and sublime. —*Dick.*

* The planet Venus. † The planet Mercury

BENJAMIN FRANKLIN.

The life of Benjamin Franklin is one of deep interest to every young man who feels ambitious of elevating himself in the ranks of society—of acquiring wealth and reputation, and of fulfilling the high duties which every citizen owes to the commonwealth. We find Franklin at seventeen years of age, entering the streets of Philadelphia, three hundred miles from friends and home, a moneyless, friendless stranger, with but a dollar in his pocket, a penny roll under each arm, and making his breakfast from a third which he held in his hands. We find him a few years after the master of a printing-office, and subsequently filling the highest offices in the country, full of knowledge and full of honors, the pride of America, and commanding the plaudits of Europe, for his discoveries in science, his efforts in behalf of civil liberty, and his unaffected kindness to his fellow-men. To show the contrast in the condition of this good man, between his early and latter life, we will quote from his memoirs, his entrance into Philadelphia, at seventeen, and his appearance in the British House of Lords at riper years.

"I was dirty from my being so long in the boat; my pockets were stuffed out with shirts and stockings, and I knew no one, nor where to look for a lodging. Fatigued with walking, rowing, and the want of sleep, I was very hungry, and my whole stock of cash consisted in a single dollar, and about a shilling in copper coin, which I gave to the boatman for my passage. At first they refused it on account of my having rowed, but I insisted on their taking it. Man is sometimes more generous when he has little money, than when he has plenty; perhaps to prevent his being thought to have but little. I walked towards the top of the street, gazing about still in Market-street, where I met a boy with bread. I had often made a meal of dry bread, and inquiring where he bought it, I went immediately to the baker's he directed me to. I asked for biscuits, meaning such as we had in Boston: that sort, it seems, was not made in Philadelphia. I then asked for a three-penny loaf, and was told they had none. Not knowing the different prices, nor the names of the different sorts of bread, I told him to give me three penny worth of any sort. He gave me accordingly three great puffy rolls. I was surprised at the qantitity, but took it, and having no room in my pockets, walked off with a roll under each arm, and eating the other.—Thus I went up Market-street, as far as Fourth-street, passing by the door of Mr. Reed, my future wife's father; when she standing at the door, saw me and thought I made, as I certainly did, a most awkward, ridiculous appearance. Then I turned and went down Chesnut-street and part of Walnut-street, eating my roll all the way,

and coming round found myself again at Market-street wharf, near the boat I came in, to which I went for a draught of the river water; and being filled with one of my rolls gave the other two to a woman and her child that came down the river in the boat with us, and were waiting to go farther. Thus refreshed, I walked again up the street, which by this time had many clean dressed people in it, who were walking the same way; I joined them and thereby was led into the great meeting-house of the Quakers near the market. I sat down among them, and after looking round awhile, and hearing nothing said, being very drowsy, through labor and the want of rest the preceding night, I fell fast asleep, and continued so till the meeting broke up, when some one was kind enough to rouse me.—This therefore was the first house I was in, or slept in, in Philadelphia."—*Franklin's Mem. vol.* 1, *pp.* 24, 25.

Before the rupture between Great Britain and these States, in 1775, Franklin resided in London, as a colonial agent. While there he attracted the notice of the elder Pitt, then Lord Chatham, who headed the opposition to Lord North's administration. Lord Chatham not only paid to Franklin the civilities due to a man of worth, but counselled him, and made him a confidant, on subjects connected with American affairs; and when about to present to Parliament a plan of pacification between the mother country and her colonies, invited him to be present at the presentation. The subjoined extract relates to what took place on that occasion.

"On Wednesday, Lord Stanhope, at Lord Chatham's request, called upon me, and carried me down to the house of lords, which was soon very full. Lord Chatham, in a most excellent speech, introduced, explained and supported his plan. When he sat down, Lord Dartmouth rose, and very properly said, it contained matter of such weight and magnitude as to require much consideration, and therefore he hoped the noble earl did not expect their lordships to decide upon it by an immediate vote, but would be willing it should lie on the table for consideration. Lord Chatham answered readily, that he expected nothing more. But Lord Sandwich rose, and in a petulant, vehement speech, opposed its being received at all, and gave his opinion, that it ought to be immediately rejected, with the contempt it deserved; that he could never believe it to be the production of any British peer; that it appeared to him rather *the work of some American;* and turning his face towards me, who was leaning on the bar, said, he fancied he had in his eye the person who drew it up, one of the bitterest and most mischievous enemies this country had ever known." "Lord Chatham, in his reply to Lord Sandwich, took notice of his illiberal insinuation, that the plan was not the person's who proposed it; declared that it was entirely his own, a declaration he thought himself the more obliged to make, as many of their lordships appeared to have so mean an opinion of it; for if it was so weak or so bad a thing, it was proper in him to take care that no other person should unjustly share in the censure it deserved. That it had heretofore been reckoned his vice not to take advice; but he made no scruple to declare, that if he were the first minister of this country [which he afterwards was] and had the care of settling this momentous business, he should not be ashamed of publicly calling to his assistance, a person so wholly acquainted with American affairs as the gentleman alluded to, and so injuriously reflected on; one, he was pleased to say, whom all Europe held in high estimation, for his knowledge and wisdom, and ranked with our Boyles and Newtons; who was an honour, not to the English nation only, but to human nature!"—*Vol.* 1. *Memoirs, pp.* 323, 324.

This deserved compliment to our countryman could hardly have come from a higher source.

How, the young reader will naturally inquire, did Benjamin Franklin rise to so high a condition from so humble an origin? By the same means, we answer, that any young man, following his example, may acquire knowledge and wealth—the means, if well applied, of rendering him respectable, useful and happy. Franklin enjoyed no greater advantages of education, or of friends, in his youth, than thousands do who will read these remarks. The whole secret is this: He Resolved to be a good and a great man, and relied, under the blessings of Providence, upon his OWN exertions to effect his end—and he nobly achieved his object. He early adopted definite rules for the government of his conduct, which had a controlling influence in his after life. These rules, among other things, inculcated study and reflection, and temperance, industry, frugality and justice. In the next number of the Cultivator, we shall speak of these rules, and his manner of enforcing them, more at large, that those who are ambitious of following his footsteps, though at a remote distance, may profit by them.—*Cultivator.*

THE CULTIVATOR—SEPT. 1834.

TO IMPROVE THE SOIL AND THE MIND.

DRAINING.

The operation of draining is performed to free land from an excess of water. Where such excess is allowed to remain, ploughing can only be imperfectly performed, and few of the cultivated crops can be grown with profit. Superfluous water is hurtful in the soil, and also in the subsoil, if it lies within the range of the roots of farm crops, by excluding air and heat, the vivifying influence of which, in the soil, is essential to healthy growth, and to the decomposition of vegetable food. If this water comes from springs, its temperature is too cold for cultivated plants; and if it settles from the surface, it stagnates, and during the heats of summer becomes deleterious alike to the health of plants and animals. Draining, therefore, is of primary importance upon most of our cultivated farms. And as the season has arrived when this operation is best performed, and when the laborers upon a farm have most leisure, we propose to make it the subject of a few remarks.

A superabundance of water may arise from various causes, singly or combined, and various methods of draining are practised for its removal.

Where there is a flat or slightly inclined surface, and a tenacious subsoil, of clay or hardpan, the rains that fall are arrested in their descent by the latter, and produce a cold, wet, uncongenial berth for healthy and vigorous vegetation. The best remedy in this case is under-draining—because it is believed the cheapest and most efficient mode, and causes no waste of land. When this tenacious subsoil is thin, and is underlaid by a porous stratum, the surplus water is often got rid of by boring or sinking pits through the tenacious layer. Pits or wells for this purpose are filled with large stones, and serve as outlets to the drains.

A tenacious subsoil is sometimes disposed in a concave or hollow form, the exterior raised and the centre depressed, so as to retain the water, and form ponds or marshes. These can only be drained by an outlet through their rims, sunk below the level of the basin, into which lateral drains, covered or open, may be made to empty, to the extent required.

A tenacious subsoil may overlay a porous one, which is filled with water; and if the strata incline from a horizontal position, as they generally do, the water from below will frequently burst through the subsoil and become prejudicial to tillage husbandry. The evil here is to be remedied by cutting underdrains, through the tenacious subsoil, or by pits through it, by which the water may at once rise and be carried off by drains. A substantial drain across the upper border of a field, will often be sufficient, in this way, to lay dry the grounds below.

When both the soil and subsoil are tenacious clay or hardpan, draining will effect but little benefit, except in preventing the approach of waters from other grounds. Resort must be here had to ridging, or underdrains repeated at intervals of 20 to 25 feet.

In many cases springs burst forth, in marshy grounds, and spread their waters over a wide extent, without being perceptible to the superficial observer. These should be intercepted at or near the source, so that their waters do not spread and saturate the soil, by sufficient drains, which may be covered, or blind drains, and should terminate in the main drain, or upon a lower surface.

The last cause of a superabundance of water which we shall notice, is that where, originating from springs, it descends from higher grounds, and saturates the slope, and perhaps the level at its base, so as to render the grounds in a measure unproductive. A porous soil often conceals the water from observation, as it filters through it without coming to the surface, but it nevertheless renders the soil cold and unproductive. These waters should be arrested and carried off by horizontal drains across the slope, as near the source of the spring as practicable; perhaps at intervals below, and also at the base of the slope. These drains should be so deep, where it is practicable, as to afford an ample channel for the water in the hard subsoil, as otherwise the water will continue to pass down upon the face of the subsoil, and under the drains. These should be covered drains also, as being more efficient in remedying the evil than open drains, and if well constructed, requiring no repair.

There are some general rules in regard to draining which are to be regarded in all cases.

All drains should be as straight as possible; as this shortens the distance, and renders the sides less liable to be worn, and the waters less apt to be obstructed. They should be made with but a moderate fall, as where the inclination is great, the bottoms are liable to be worn by the water. They should penetrate the subsoil or hardpan, a sufficient depth to contain all the water that comes from above. Open drains should be so large as to contain and carry off all the water that may at any time be required to pass through them. The sides should be sloping, according to the nature of the soil; the more porous and spongy this, the greater slope is required.—They should in no case, perhaps, be less than three feet broad at the surface. I never make them less than four. They should be comparatively narrow at the bottom, as, by concentrating the water, the current acquires new force, and carries off the earth and other obstructions which would otherwise accumulate. The sides of all drains should be preserved firm and unbroken, and should be carefully cut with the spade, in the direction desired, and as the digging progresses. The sides of under drains may be perpendicular, and the breadth of the drain need be no greater than is required for the convenience of the workmen; but such drains should be filled as fast as they are dug out; because, if left open for any length of time, the earth is not only apt to fall in, but the sides get into a broken irregular state, which cannot afterwards be well rectified. It also deserves attention, that in most under drains, a proper covering of straw or sod should be put upon the top of the materials, to keep the surface earth from mixing with them.

The pit method of draining, is often effectual, when properly executed. When it is sufficiently ascertained where the bed of water is deposited, which can easily be done by boring with a post auger, sink a pit into the place, of a size which will allow a man freely to work within its bounds. Dig this pit through the tenacious subsoil, or of such a depth as to reach the bed of the water meant to be carried off; and when this depth is obtained, which is easily discerned, fill up the pit with big stones, and if the water rises, carry it off by a stout drain to some adjoining ditch or mouth.

Under drains are constructed of various materials, as stone, brick, tiles, brush, wood, turf, &c. Where they can be had, stones are unquestionably the best material.

Stone drains are of three kinds. A common, but the least efficient mode, is to dig a trench from two to three feet deep, and fill it half full or less, with stones promiscuously thrown in, and then to fill it up with earth. The next method is, to lay at the bottom a regular drain with suitable stones, with an aperture of six or eight inches, upon which six or eight inches of stones are deposited in compact order, and then the trench is filled with earth. This sort of drain is extensively used in Scotland to drain large tracts of wet or boggy ground, and they are sometimes carried to the depth of 16 and 17, and commonly of 4 to 6 feet. An accurate survey is made of the grounds and drains, that in case of obstruction, the latter can be readily found. A third mode, and which we particularly recommend, on account of its permanency as well as cheapness, in all situations where it is practicable, is to use *broken stone* as the draining material. In constructing these a trench is first dug two feet deep; in the centre of the bottom a narrow sloping spit is then taken out, to be filled up with the broken stone, and carefully cleaned, after which the stone is deposited, and covered either with other stones, straw, brush, or sods, to prevent the loose earth getting into the draining materials. The dimensions of the draining section, a term which we apply to that part filled with the broken stones, may be proportioned to the quantity of water that is required to pass, and the abundance of the draining material. A spade, of the intended shape of the drainage section, must be provided to dig it, and also a scraper, to smooth the sides of the cut, and to take out the loose earth. This spade should be eight to ten inches long, should taper from the upper to the lower end, and possess a strong socket for the handle, and a stout iron pin projecting from it, on which the foot may be placed to drive it into the ground. A spade six inches broad at top, and three or four inches at bottom, is in most cases sufficiently large. The scraper resembles a large pod auger, with a goose neck and long handle, with which the workman cleans the cut, as he progresses, without changing materially his position. A cubic yard of broken stone, the price of breaking which is ordinarily 62½ cents, will fill about seven yards of a drain of the above dimensions. Under-drains cannot well be constructed, in this way, in bog earth or in quick sands: Their advantages, in a more tenacious stratum, arises from their not being liable to be disturbed by the plough, or the dread of cattle; their affording no harbor for moles; their not being liable to be worn away by the attrition of the water which passes in them, or choked up by water and earth from the surface. These drains possess no large cavities; and the water rather filters than runs through them.

Straw drains are sometimes employed, where better materials cannot be had. They are formed somewhat like the preceding, except that the under cut should not be above three inches at top, and one inch, or one and a half inches broad at bottom,—and that a rope of straw, of adequate size, instead of broken stone, is employed to fill them. To give strength to a spade of the required dimensions, it should be made rounding on one side. The straw will fill only 5 or 6 inches of the cut, leaving an aperture below for the water of three or four inches. If there is a constant run of water, it will, as its force is concentrated in the narrow bottom, generally keep it free from all obstructions. The sod taken from the surface of the ditch, should be preserved, and laid in upon the straw rope. The expectation is, that before the straw has decayed, the earth upon it will have become so compact as not afterwards to settle and close the drain.—In some parts of England, sods are substituted for straw, in which case they are cut from 12 to 18 inches in length, and are set in with the grass side downwards, and pressed in as far as they will go. I last year employed straw in draining some acres of wet springy land, in the manner above described, much of which had before been too wet for the plough, and even for the better grasses. Upon the field I have this season planted corn and potatoes, and the crop is very promising. The draining cost about 9 cents the rod.

Brush drains are made in different ways. Faggots, tied in bundles, of a proper size, are sometimes laid in the bottom, to the thickness of one or two feet. At other times, the trench being dug with shoulders like that intended for straw, short sticks are laid across the lower aperture, and the brush then laid in. Our practice has been, to take dwarf pines, the buts from three to six inches, cut them into lengths of four or five feet, and commencing at the upper end of the drain, proceed to lay them in regularly and compactly, the buts downward, in a sloping form, until the drain is filled. The trench is then apparently full. The brush is then brought within the edges, smartly trod down, and the earth filled in. *Brush drains should be sunk so deep as to have the brush, when pressed upon by the earth, below the reach of the plough, at least six inches*, otherwise they are liable to be disturbed and choked by loose earth. *The brush should be used in a green state*, and with the leaves upon it if practicable, as in this condition it lasts much longer.

A mode of draining clay soils wet by rain or surface water, practised by Sir A. Fletcher, is thus described in the New Edinburgh Encyclopedia:

"The upper soil is of good quality but being situated in a mountainous part of the country, the frequent rains kept it so full of water, that it produced only a coarse grass, worth 3s per acre. The inferior soil of clay was of great depth. On grass lands he digs 22 inches, or 2 feet deep; the first spadeful is of the turf, taken so deep as where it separates from the clay; the turf is dug carefully out and preserved unbroken, with its grass side up, and laid on one side of the cut; then, with a very strong spade, 18 inches long, 6 inches wide at top, and 2 at the bottom, he digs a spadeful in the clay, which the men spread about the land, on the side of the drain opposite to which the turfs were laid, as far as possible from the drain, so that none may get in again. A scoop follows to clear out the fragments in the bottom, which are also spread in like manner. They are then ready for filling; and, in doing this, he takes three stone of a thin flat form, two of which are placed against the sides of the drain, meeting at the bottom; and the third caps the other two. Thus a hollow triangular space is left to convey the water, which is subject to no accidents that can fill it up, or impede the current. Stones always sink deeper in the ground; and in the common method, this frequently causes stoppages, by their being partly buried in the clay; but the triangle, when it subsides, does it regularly, and keeps its form and the passage of the water clear. One cart-load of stones in this way, will do a considerable length of drain. They are carefully laid down by the side of the cut, with a shovel or basket; and if there are any small refuse stones left on the ground, after the drain is set, they are thrown in above. The stones being thus fixed, the sods are then trimmed to the shape of the drain, and laid on

them with the grass side downwards, and none of the clay used in filling up."

There are various other methods of draining, not so likely to be employed among us, at least for the present, which the protracted length of this article prevents our noticing at this time. We have practised many of the modes above suggested, and can confidently recommend the system of thorough draining as among the most profitable expenditures which can be made upon a farm. We have some other remarks upon this subject under the head of *Correspondence.*

With regard to the duration of hollow drains, or the length of time that the water will continue to flow in them, and preserve the soil in a proper state of dryness, it must necessarily depend, in a great degree, upon the nature of the materials with which they are filled, and the care that has been taken to prevent their being choked up by any soft soil. Independent of this last circumstance, a drain filled with stones, like the channel which supplies a natural spring, may endure forever. Wood perishes at certain periods according to its nature; but it does by no means follow, that the drain should lose its effect in consequence of the destruction of the wood. If the earth over it form itself into an arch, the water will still continue to flow. Accordingly, drains filled with bushes and straw have been known to run well after forty years.

ON THE COMPARATIVE ADVANTAGE OF FEEDING LIVE STOCK ON RAW OR ON PREPARED FOOD.

The Agricultural Society of Scotland, in 1833, offered a premium of thirty sovereigns for the best report, founded on actual experiment made for that purpose, on a number of oxen or heifers, not fewer than six, the animals to be of the same breed, age and sex, and the term of feeding not less than three months; and a premium of ten sovereigns for a like report on feeding ten or more swine.—Five reports were received, which appear in the Quarterly Journal of Agriculture for June, 1834. We record the result of these experiments, which purport to have been made with scrupulous accuracy, for the information of the numerous patrons of the Cultivator.

Robert Walker made his experiment with six two year old heifers, and four two year old stots, (steers;) each was divided into two lots and fed on like food, except that one-half received their food raw, and the other half in a steamed or cooked state. The food consisted of Swedish turnips, potatoes and crushed beans, with a little salt and straw. At the end of three months, it was found that the three heifers fed on steamed food had gained 48½ stone, or 679 lbs. and the three heifers fed upon raw food had gained 45½ stone; but the quantity consumed by the first lot exceeded that of the latter.

Cost of feeding on steamed food, ...	£14	1	3
" on raw food, ...	10	6	7½
The first cost more than the last, ...	£3	14	8½

Deducting the first cost, and the price of fattening, from the price paid by the butcher, there remained a profit on the three heifers fed with steamed food of nine shillings; while the profit on the three fattened on raw food, amounted to £3 10s. 6d. By a like estimate, the loss on the steam stot was 3s. 8½d. and the profit on the one fed with raw food was 10s. 6d. The two other stots were put to good grass on the 25th May. On the 18th of October, they were found to have gained alike, each 12 stone.

Mr. Andrew Howden made a like experiment with 18 cattle, in six lots. Their increase, and expense of keeping, for three months, from 20th March to 20th June, were as follows:

	Lbs.	Expense.		
Three heifers on raw turnips, ...	392	£6	18	0
" " on steamed turnips, ...	532	8	18	0
" " on raw potatoes, ...	600	10	7	0
" " on steamed potatoes, ...	572	10	7	0
" stots on raw potatoes and corn, ...	722	9	4	0
" " on boiled potatoes and corn, ..	689	9	5	0

John Baswell gives the result of his experiments on feeding ten horned cattle and ten hogs, on raw and prepared food. The expense of keeping the five cattle on raw food was £32 2s. 1d. while that of the cattle on prepared food was £34 5s. 10. On being slaughtered, the two lots appeared to be very similar, but the particular weight is not mentioned.

The purport of these reports implies, that there is very little if any advantage in cooking food for neat cattle. But in regard to hogs, the experiments show a different result. The gain and expense of fattening Mr. Baswell's hogs are stated as follows:

	Cwt.	qr.	lbs.	Expense.		
Five hogs fed with cooked food, ...	4	2	7	£6	19	4½
" fed on raw food, ...	2	2	21	5	8	6

W. Dudgeon made his experiment with twelve pigs, six *he* pigs in one lot, and six *she* pigs in another, afterwards subdivided, to ascertain the respective merits of the sexes for feeding. The result was decidedly favorable to the cooked food, notwithstanding the expense was 20 per cent the greatest. The pigs were fed from the 2d July to the 12th October, at which latter date the *he* pigs had gained 38 stone 6 lbs. and the *she* pigs 17 stone 11 lbs. The result satisfied the reporter, that prepared food is best to be given to pigs, and, besides, that the pork is superior to that of hogs fed on raw food.

Robert Walker made his experiment with ten pigs, five fed on steamed potatoes, and five on raw potatoes, with a daily allowance of 2½ lbs. broken barley each lot. The result was as follows:

1833, March 4.—Live weight of 5 pigs on raw food,	108 lbs.
June 1.— " " "	223
Gain, ...	115 lbs.
March 4.—Live weight of 5 pigs on steamed food,	106
June 1. " " " "	279
Gain, ...	175
Difference in favor of steamed food	58 lbs.

But what comes nearer to our practice, are the experiments of the Rev. H. COLMAN, one of our best practical farmers, in whose accuracy we may put implicit confidence. Our hog feed differs from that of Europe; and the main questions to be decided here, are, whether Indian corn is most profitably fed in a dry unground state, in the form of Indian meal, or cooked preparatory to its being fed. Soft or pig corn will be fed in the cob; and potatoes and pumpkins, of which every farm affords, or ought to afford, a considerable supply, should unquestionably be cooked; yet we generally finish off our pork, after the refuse of the farm is exhausted, on sound corn; it gives solidity and flavor to the pork; and the question, we repeat, is, in what form is this sound corn most profitably given? Mr. Colman's experiments were instituted in 1833, with a view not only to solve this question, but to ascertain the profit or loss incident to fattening pork with corn, and the age at which it is most profitable to put up swine to fatten. We regret that the limits of our monthly sheet will not permit us to give the whole of Mr. Colman's excellent communication, which we find in the Transactions of the Essex Agricultural Society for 1833. We however copy the account of his experiments, and his closing remarks.

" EXPERIMENT I.

" Two hogs one year old; one of them a barrow in very good condition; the other a barrow recently gelded, and in ordinary condition, were put up to be fed exclusively upon Indian hasty pudding, or Indian meal boiled with water. We began feeding them the 1st of March, 1831, and weighed them again on the 19th of the same month. In the 18 days they consumed six bushels of Indian meal. They were offered cold water to drink, but did not incline to take any. The result—

No. 1 weighed on 1st March, ...	233 lbs.
" " 19th "	269
Gain, ...	36
No. 2, (recently gelded,) weighed on 1st March...	190 lbs.
" " " 19th " ..	247
Gain, ...	57

The gain of the two was 93 lbs. in 18 days. The quantity of meal consumed by them was 10 qts. per day to the two. This allows 30 qts. to a bushel, deducting two for grinding. The price of corn at the time was 70 cents per bushel. The expense of the increased weight is 4.5 cents per lb.

March 21, 1831. Killed the hog mentioned first in the foregoing experiment. Live weight 273 lbs. Weight when dressed 215 lbs. Loss in offal, loose fat included, 59 lbs. or a little more than one-fifth.

EXPERIMENT II.

No. 2, mentioned above, weighed on 23d March,.... 253 lbs.
" " " " 30th April, ... 312

In 38 days, gain,..... 59 lbs.

No. 3, a shoat purchased from a drove, weighed on 28th March, 100 lbs.
on 30th April, 151

Gain in 33 days,..... 51 lbs.

This is a fraction over 1 lb. 8 oz. per day each, nearly 1 lb. 9 oz. In this case their food was exclusively boiled potatoes mashed with Indian meal. Exact amount consumed not ascertained, but fed as freely as they would bear.

EXPERIMENT III.

The two last named hogs were for the next twenty days put upon Indian hasty pudding exclusively, with the following result:

No. 2 weighed on 30th April,..... 312 lbs.
" " 20th May, ... 382

Gain in 20 days,..... 70

No. 3 weighed on 30th April,..... 151 lbs.
" " 20th May, ... 185

Gain in 20 days,..... 34

The two in the above named 20 days, consumed four and one-half bushels of meal cooked as above. Meal 78 cents per bushel. Gain of the two, 104 lbs. in 20 days.

EXPERIMENT IV.

Sundry swine purchased from a drove, and fed with meal and potatoes washed and mashed.

	28th March, 1831.	19th May, 1831.	
No. 1 weighed	97 lbs.	165, gain in 52 days,	68 lbs.
2 "	134	182, "	48
3 "	100	186, "	86

The two following, raised on the farm, and fed as above—

	25th April, 1831.	19th May, 1831.	
No. 4 weighed	151 lbs.	206, gain in 24 days,	55 lbs.
5 "	140	165, "	25

EXPERIMENT V.

In this case it was not intended to force their thrift, but to keep the swine in an improving condition. They were shoats of the last autumn, and were of a good breed.

Tuesday, 3d April, 1833. Put up four shoats, and began feeding them with Indian hasty pudding.

	3d April.	22d April.		25th June.	
No. 1,	176 lbs.	202 lbs. gain	25,	264 lbs. gain	62
2,	119	153 "	34,	226 "	73
3,	150	170 "	20,	218 "	48
				[Total,	183 pounds.
4,	121	145 "	24,	Killed 30th May.	

From 3d April to 22d April, the above swine consumed seven bushels and one peck of Indian meal. From 22d April to 25th June seven bushels of Indian meal cooked as above.

One of the above, No. 4, was killed on 30th May; being absent, the live weight was not ascertained.

On the 25th June, the three remaining hogs were weighed, and in the 63 days from 22d April to 25th June, they had gained in that time 183 pounds as above.

After 30th May, when one of them was killed, one peck of meal made into hasty pudding with a small allowance of the waste of the kitchen for a part of that time, lasted them three days, that is 22.25 or less than a quart, say ⅞ths of a quart per day to each.

☞ At first we employed half a bushel of Indian meal to make a kettle of hasty pudding; but we soon found that a peck of meal, by being boiled sufficiently, would make the same kettle nearly full of hasty pudding, and of sufficient consistency. The kettle was a common sized five pail kettle, set in brick work in the house; and it was remarkable that the peck of meal produced nearly the same quantity of pudding that we obtained from the half bushel, which showed the importance of inducing the meal to take up all the water it could be made to absorb.

The price of Indian corn was at that time 75 cents per bushel—30 quarts of meal to a bushel, deducting the toll. The amount of meal consumed in the whole time, from 3d April to 25th June, was 14¼ bushels—the cost $10.69—the total gain, making no allowance for the gain of No. 4 from 22d April to 30th May, which was not ascertained, was 287 lbs.

The gain of No. 1, 2 and 3, from 22d April to 25th June, was 183 lbs. in 63 days; and allowing one peck to serve the three hogs for three days, required 5¼ bushels, the cost of which was $3.94. The live weight could not be estimated at less than 4 cents per lb. when pork was at market 6 cents.

The value of the 183 lbs. therefore was equal to $7.32, or at 5 cents, to $9.15.

The gain of the swine for the first 19 days, from 3d to 22d April, was,

No. 1, 26 lbs. or 1.368 per day.
2, 34 " 1.789 "
3, 20 " 1.052 "
4, 24 " 1.263 "

The gain from 22d April to 25th June, 63 days, was,

No. 1, 62 lbs. or 0.984 per day.
2, 73 " 1.158 "
3, 48 " 0.761 "

The difference of daily gain in the two periods was attributable to the diminished quantity of meal. The question then arises, whether the first mode of feeding was as economical as the second?

In the first 19 days, 7 bushels 1 peck con'd gave 164 lbs. gain.
" next 63 " 5 " 1 " " 183 "

Had the first gain been in proportion to the second gain, in reference to the meal consumed, the seven and one-fourth bushels which gave 104 pounds, should have given 252 5.7 pounds. This great disparity can be explained only in the more economical preparation of the meal, by which a peck, taking up as much water as it would contain, gave a kettle nearly full of pudding, when half a bushel of meal, imperfectly prepared, gave little more. This seems to demonstrate the great advantage of cooked food, both as it respects its increase of bulk and the improvement of its nutritive properties.—Whether it would apply to those substances, whose bulk is not increased by cooking, equally as to Indian meal and the like, is a matter which experiments only can determine.

Such are some few trials in reference to the feeding and fattening of swine, which I have made, or information of which I have obtained from other sources, which may at least lead the inquisitive farmer to further experiments and inquiries, on a subject of great importance to his interest. The inferences to be made from them I shall leave to others. The results, as will be observed, are not uniform. The thrift of animals must depend on various other circumstances besides the kinds or the quantity of food given them. Much depends on the breed, as every farmer knows; much on the health of the animal; something on the season of the year. I failed in attempting to fatten several swine in one case, though they were carefully attended, and various kinds of feed were tried, and the failure was totally inexplicable until they were slaughtered, when the intestines were found corroded with worms, resembling those found in the human stomach, and this, I have no doubt, prevented their thrift. The same fact has occurred in another instance, and with the same result. I failed in attempting to fatten some other swine, who had been driven a considerable distance and exposed, probably not even half fed on the road, to severe cold and storms. Some of them were frost bitten in their limbs; and though attended and fed in the most careful manner, they made no progress for months. In an experiment recently made, of giving swine raw meal mixed with water, I have found a falling off in their gain of nearly one-half, compared with giving their food cooked, such as boiled potatoes and carrots, mixed with meal while hot; the result being, in a stye containing a number of swine, as 279 to 500. In respect to confinement or freedom, various opinions are entertained. "Elder Turner, of New-York, says, that hogs should never know what liberty is, but should be kept close all their lives, and as inactive as possible. That by this method double the quantity of pork can be produced with the same expense of feed."* F. Peabody, Esq. informed me that the Shakers at Canterbury, N. H. told him that they deemed it indispensable to the thriving of their swine that they should have access to water to wallow or wash themselves in; and that they by no means did so well without it. On this point I have had no trial farther than to satisfy myself, that fatting hogs are injured by being suffered to root in the earth.

With respect to the age at which it is advantageous to put up swine to fatten, I have only to remark, that it is with swine as with

* N. Y. Memoirs of Agri. Vol. 2, p. 50.

other animals, there are some breeds which come much sooner to maturity than others. A successful farmer in Saratoga county, N. Y. says that March pigs, killed about christmas, are the most profitable for pork. Four pigs of what is called the grass breed, were slaughtered at Greenfield, New-York, which weighed 348 lbs. 318 lbs. 310 lbs. and 306 lbs. at nine months and seventeen days old.

On this point, however, I take leave to present a letter with which I was honored by John Lowell, Esq. whose authority in the agricultural community is justly estimated.

"*Boston, April* 18, 1831.

"To Rev. Henry Colman,

"Dear Sir—I have been prevented by the state of my eyes from answering your inquiries as to my experience in raising old or young pigs. * * * * * I never wintered any pigs, as no person resides on my place from December 1st to May 1st. It was therefore matter of importance to me to ascertain on what description of pigs, or rather of what age, the most flesh could be put in my limited time with similar treatment. I may say that I have fully and clearly ascertained, from a trial of 20 years, that young pigs of from 25 to 30 pounds, will give nearly double, in some remarkable cases three times, as many pounds as shoats of 6 months weighing from 100 to 150. I have taken two pigs of 100 lbs. each, age six months, and never was able between May and November, to get them above 180, rarely above 170. I have taken three pigs of about 30 lbs. each, and on the same food which I gave to the two that would weigh from 170 to 180 each in the same period; nay I have taken pigs of 200, and never could get them to weigh more than 300 in seven months on my food. The way I ascertain the quantity of food is, that I never give any thing but the produce of my dairy, and the refuse of the garden, peaches, apples, and cabbage, which are uniform generally.

3 pigs of 90 wt. or 30 wt. each, will give ordinarily 510 lbs.
Less original wt. 90 often not more than 60.
Gain, 420 lbs.

2 pigs of 100 wt. each, will give ordinarily 330 lbs.
Less original wt. 200
Gain, 140 lbs.

"But the 3 pigs of 90 will not consume for the first three months half so much as the 2 of 100 each, and I have kept a 4th and sold it in August for quarter pork.

"There is nothing new or remarkable in these facts. It is the law of the whole animal creation. It is true of the calf and of man. The child of 7 lbs. quadruples its weight in 12 months; and the calf of 60 wt. if fine and well fed, will weigh 600 wt. at the end of the year, and (if a female,) will not double the last weight at any age.

* * * * * * * *

"Yours, very respectfully,

"J. LOWELL.

"P. S. It should be remarked that the weight at purchase is live weight, and at sale dead or nett weight, because in truth to the owner this is the true mode of considering the subject. No doubt my sort of food is peculiarly favorable to young animals, it consisting in very liberal allowance of milk. If the older pigs were at once put on Indian meal they would attain to 250 at a year old, but the cost of the meal 70 cents per bushel would amount to 9 dollars, and if the first cost 5 dollars 50 cents, be added, and the pig sold at 6 cts. there would be but two dollars gain on two pigs of 100 lbs. each; while three small pigs without meal, fed on milk, would give 24 dollars in the same time. I do not mean to give minute details, but general views.

"As an important qualification of the foregoing statement it should be added that shoats of six months bought out of droves, have usually been stinted in their growth, and animals, like trees, recover slowly after a check. I presume if shoats were taken from a careful and liberal owner, the difference would be less. But as a general law it may be safely affirmed, that weight for weight at the purchase, the younger the animal the greater the positive, and the far greater the nett gain. At least such is my own experience and belief."

The foregoing letter of this intelligent and practical farmer, is entitled to particular consideration. I have one or two other statements which deserve attention. It is stated in the Domestic Encyclopedia, article Soiling, that "Twenty-five shoats were fed for three months with green clover cut from less than one acre; they were then fed on Indian corn, and when killed weighed three thousand pounds." This is certainly an extraordinary statement, and I have no other authority for it than what is here given. But the Rev. Thomas Mason, of Northfield, Mass. showed me the 27th September last, three fine thrifty swine about nine months or more old, nine-tenths of whose feed, as he assured me, since the 13th of May last, had been obtained from one-eighth of an acre of clover, cut and given to them green.

The preceding facts and experiments encourage the belief that hogs may be raised and fattened by the farmer to advantage, where corn is worth about seventy cents per bushel, and his pork will bring him six cents per pound. Like almost every other business, especially of an agricultural nature, success must greatly depend on skill, care, selection and good management. The best swine that I have ever found have been in dairy countries, for there cannot be a doubt that milk and whey for every animal are among the most nutritious of aliments. Indian meal probably ranks next, though many farmers prefer a mixture of provender, such as corn, oats, rye or barley; but I believe in all cases, cooked food will have a decided advantage over that which is given in a raw state; an advantage more than equivalent to the labor and expense of its preparation. Potatoes are a valuable article of food, but the pork is not so good as that fattened upon corn. Carrots are more nutritious than potatoes. Corn given in a raw state or on the ear is a most wasteful management.

Swine ought to be kept on every farm in sufficient numbers to consume all the offal and waste of the dairy and kitchen. If beyond this, a breed can be obtained, which will arrive at early maturity, and which can be advantageously grass fed or kept at a small expense and in an improving condition through the summer; and being put up to fatten early in autumn and forced as much as possible so as to be sent to market early in the winter, the farmer will ordinarily find a fair profit in this branch of husbandry. A very great advantage is found in the keeping of swine from the valuable returns of manure both in quantity and quality, which are obtained from them, where care is taken to supply them with raw materials for the manufacture. Too much care cannot be bestowed in the selection of the breed and the general health of the animal when put up to feed; and it is strongly recommended to every careful farmer occasionally to weigh the animal and measure the feed, that he may ascertain seasonably on which side the balance of debt or credit is likely to fall. Nothing is more prejudicial to good husbandry than mere guesses and random conjectures; and though the result of our operations may not meet either our wishes or expectations, an intelligent and reflecting mind will be always anxious as far as practicable to know precisely how far they correspond with or disappoint them. Truth, exact simple truth, in every thing, is the proper pursuit and most valuable possession of the human mind; and more nearly than any thing else connected with man's true interest and happiness.

HENRY COLMAN.

Meadowbanks, Deerfield, 20th April, 1834.

TOPPING CORN.

Experience and science concur in disapprobating the common practice of topping corn. The experiments of Mr. Clark and Mr. Lorain, which we have published in the Cultivator, go to show thot it diminishes the crop; and the principles of science corroborate their report. The corn is nourished by the sap elaborated in the leaves *above* the ears, and when these elaboratic organs are taken away, the supply of food must cease in whole or in part. If fodder is the object, it is far better to cut the whole crop at the ground, when the corn is seared. This mode has two other recommendations: it clears the ground for fall grain, and the corn derives nourishment from the stock after it is cut. We invite our brother farmers, with a view of arriving at a correct result, to do as we intend, that is, to set apart three parcels of corn of similar dimensions, and quality, say three adjoining rows—to top one part, cut another at the ground, and to leave the third to ripen with the stalks; and, at the proper time, to husk, measure and weigh the three parcels separately. The results of a dozen such experiments will lead to pretty correct conclusions as to the best method. We not only invite them to make the experiment, but to communicate the results for publication in the Cultivator.

The work is foolishly executed by *many*, which might be accomplished by a few.

ESSEX AGRICULTUTAL SOCIETY.

We have received No. III. Vol. 2, of the Transactions of the Essex (Mass.) Agricultural Society, comprising its proceedings in 1833. We are indebted for this, as well as for the previous transactions of that society, to the Rev. H. Colman. The recent number is an 8vo. of 100 pages. It contains the annual address, delivered by Doct. Spafford; the annual reports—1. On farms, describing the quality and management of those offered for premium, with statements appended, of the owners, stating the labor employed, the method of culture and products: 2. On milch cows: 3. On the dairy: 4. On domestic manufactures: 5. On cider: 6. On potatoes: 7 and 8. On ploughing: 9. On the cultivation of the white mulberry tree, &c.: 10. On animals: 11. On turning in green crops for manure: and 12. On the cultivation of wheat and rye. And also a list of the premiums to be awarded in 1834, and a communication of the Rev. Mr. Colman on swine.

It will be seen that these pamphlets contain the best modes of practice, in the various departments of husbandry, in the county; and that this knowledge is annually disseminated by the society; so that each individual can profit by the skill, enterprise, and improvements of all; and if we consider the laudable emulation which the premiums and the pride of excelling are calculated to produce, we cannot fail of ascribing to the society a high degree of usefulness, both in increasing the labors of husbandry, and in rendering these labors more profitable to those who perform them. Among the enterprising members of this society, who have contributed largely to its prolongation and usefulness, we have recognized with pleasure two of our clerical acquaintances, both actively engaged in the labors of the field—the Rev. H. Colman, and the Rev. G. B. Perry. May they long enjoy the reward to which their useful services justly entitle them. As a specimen of the products, we abstract the following:

Joseph Kittredge improved 54 acres. The labor was performed by three men, with the addition of 50 days labor. He produced 238 bushels of corn, 207 bushels barley, 57½ do. oats, 18 do. wheat, 40 do. rye, 358 do. potatoes, 60 tons of hay, 60 barrels cider, 50 barrels winter apples, 574 lbs. butter, 1,826 lbs. pork, 5,000 lbs. beef—and kept the ordinary farm stock.

Thomas Chase cultivated 98 acres. He sold from these, besides family consumption, the following: Apples and cider, $18.50; beef, pork, pigs, calves and lambs, $243.94, about 120 lbs. wool, chiefly merino, 674 lbs. butter, 2,032 lbs. cheese, besides potatoes, grain, &c. These specimens will suffice for farm products.

Of the Dairy, we learn, that Richard Heath, from nine cows, made 2,249 lbs. cheese in four months; that Wm. Thruston made about 2,500 lbs. from 12 cows, in three months. His method of making cheese is described as follows:

"The rennet is taken from the calf, and allowed to become perfectly cool, when it is slightly rinsed in cold water and put down with strong rock salt. When taken out for use, one rennet is put into a stone pot, and one quart of water (after being boiled and cooled) put to it, and a cold brine, sufficiently strong to keep the rennet, is made with the same kind of salt. Of this liquor is used from a gill to half a pint to every thirty gallons of milk, according to the strength of the rennet, heat of the milk and state of the weather; always taking more rennet when the weather and milk are cooler, less when warmer. It is then allowed to stand from three-quarters to a full hour before breaking up the curd, believing it to be very important during the warmth of the weather to get the curd, in the press as early as possible. From the beginning of breaking up the curd, the operation is continued till it is sufficiently hard and fit to scald, when it is scalded from fifteen to twenty minutes with scalding whey, as the tenacity and state of the curd require. It is then allowed to remain till perfectly cool, when it is ground up in a curd mill; after which process it is put into the cheese hoop in layers, salting each layer by judgment, as the softness, hardness and tenacity of the curd require, using the dry and whitest Liverpool blown salt. It is then put into the press, and allowed to stand half an hour, when it is first turned; then it is allowed to stand from two to three hours, according to the state of the weather, two hours in very warm, three in more moderate weather, when it is again turned; and it is regularly turned every two or three hours through the day, till dark, when it is left in the press through the night. The following morning it is taken from the press and put in brine, where it remains twenty-four hours, being turned at sun down. At the expiration of the twenty-four hours, that is, on the second morning, from the milk, it is taken from the brine and swathed in a linen bandage, which is continued on from seven to nine days as is requisite, turning the cheese twice in twenty-four hours through the heat of the weather, rubbing them daily with pork or bacon fat, in which red peppers have been summered, and afterwards settled and strained off."

Considerable competition is manifested in the culture of the white mulberry. The Rev. Mr. Perry exhibited to the committee 5,500 transplanted trees, besides a very extensive nursery of two years growth. He also showed a mulberry hedge of 150 rods, of two and three years growth. Mr. Perry also exhibited to the committee about 450 sugar maple trees, transplanted from the forest, many of them near the walls of the enclosures, and others in the form of an orchard, thirty-three feet apart one way and sixteen and a half the other. This gentleman received the second premium of $15. Other nurseries and plantations, of 4,000, 25,000 and 30,000 mulberry trees were offered for premium, and also parcels of 8,000 and 20,000 cocoons. Mr. Eaton exhibited 8,000, weighing twenty-three pounds. The leaves for the worms were gathered and fed out by his two sons, eight and thirteen years old, assisted by their mother in cleaning. The average number of cocoons to the pound was 230. The worms were fed from thirty-two to forty days before they formed their cocoons. The committee discovered a decided advantage in the growth of those trees from which the tap root had been cut off when they were transplanted. The committee consider the culture of the mulberry and the manufacture of silk, as promising a more profitable reward than the usual course of field husbandry.

The county of Essex is of limited extent; and the soil, by a west New-Yorker, would be deemed very inferior. It abounds in rocks, stones and marshes. But it would seem, that where nature has done least, man does most; and that our rational enjoyments are graduated not so much by the bounties of nature, as by our personal exertions to procure those enjoyments. This county is exhibiting a noble example. She has established a permanent fund of about 6,000 dollars, which is profitably invested, the income of which enables the society to defray its contingent expenses, to print its transactions, and to award $500 dollars per annum in premiums. This investment, in all probability, benefits the county, annually, four times its amount, in the increased products of its agriculture, and in the consequent thrift of every other kind of business. It is not so much the concentration of great capitals in the hands of a *few* individuals, that constitutes a country's prosperity and happiness, but it is the general diffusion of knowledge and competence among *all classes*, with the moral and social habits which industry confers and establishes, that give health, strength, and prosperity to a people.

IMPROVED CHEESE SHELVES.

In large cheese dairies, the labor of daily turning the cheese, while undergoing the drying process, is considerable and fatigueing. The *Repertory of Patent Inventions*, describes a machine of simple construction, invented by Mr. Blurton, of Field Hall, near Uxoter, calculated greatly to abridge this labor. We copy this description for the benefit of the cheese dairy readers of the Cultivator.

"The machine consists of a dozen strong shelves, framed together, and having bars nailed from top to bottom of one side to prevent the cheese falling out while in the act of turning. The frame is suspended on two strong pivots, one of which is set into the wall of the room, and the other is supported by a strong post. Two catches keep the frame upright, and prevent it from being turned more than half round. By first filling the shelf immediately below the axis of the frame, and then placing the cheeses alternately on the two nearest shelves to that which has been already filled, the preponderance on the one side over the other can never be more than the weight of one cheese; the whole power, therefore, required to turn the machine cannot, in any circumstances, be greater than the weight of a cheese and the friction of the pivots. The cheeses, in the act of turning, drop on the shelves which, in the former position of the frame, were above them, and having been exposed to a current of air for twenty-four hours previous, have become perfectly dry.

"Mr. Blurton has had the machine in use for five or six years, and finds that by means of it fifty-five cheese are turned in the same time which is required for turning two by hand. Three other advantages attend its use; first, that a room thus furnished will hold thrice as many cheeses as when they are laid on the floor; second, that the shade afforded by the shelves, together with the current of air which passes between them, has the effect, in hot weather, of preventing excessive sweating, and consequently loss both in weight and quality, as well as diminishing the necessity of rubbing the cheeses; thirdly, the ripening of the cheese is hastened, so that on an average they are ready for market five weeks earlier than usual."

SMUT IN GRAIN.

This disease, particularly in the wheat crop, causes a great deterioration in the quality, and consequent value of the grain, and is the cause often of heavy loss to the farmer. It seems to have prevailed in the time of the Roman empire, and is mentioned by Pliny and Columella; yet down to the present day the origin of the evil is not satisfactorily known, though the surmises and speculations, and experiments have been without number. Jethro Tull ascribed it to moisture. Duhamel, after recapitulating the different opinions and experiments on the subject of smut, con-

cludes with observing, that smut powder is highly infectious, and recommends leys of lime, salt-petre, alum, verdigris, salt, and wood ashes. Lord Somerville was of the opinion, that the disease was occasioned by an insect. In the course of his researches, by using highly magnifying lenses, and by concentating the light of the sun on the smut ball, by means of a concave mirror, he discovered that the specks on the ball were real insects, resembling wood-lice in shape. He then conceived, that when the smut powder comes in contact with sound grains, it adheres to them, and inoculates them, so as to render the plant incapable of producing any thing but smut. Linnæus, Walker, and other naturalists, were of the same opinion, that insects caused the smut. Sir H. Davy was of opinion, that smut is produced by a small fungus on the grain, as the products it affords by chemical analysis are similar to those afforded by the puff-ball, and thinks that without the agency of some organized structure, so complete a change could not be effected in the constitution of the grain. Wildenow thought that smut proceeded from a fungus, which multiplied so as to occupy the whole ear. Prevost ascribes it to a microscopic vegetable of some sort; and Jussieu says, the proximate cause of smut may be attributed to infection of the seed, by the dust of the smut ball, (Lycoperdon.) Bauer, of Kew, whose remarks on the grain worm we quoted in our 2d and 6th numbers, says the smut "is occasioned by a very minute parasitic fungus, of the genus *uredo*, being absorbed by the roots of the germinating wheat grains, and propelled by the rising sap, long before the wheat blossoms, into the young germen or ovum, where the seeds of the fungi vegetate, and rapidly multiply; thereby preventing not only the fecundation of the ovum, but even the development of the parts of fructification. In consequence no embryo is produced in an affected germen, which however continues to grow as long as the sound grains do, and, when the sound grains arrive at maturity, the affected ones are generally larger than, and are easily distinguished from, the sound ones, by their darker green colour, and from the ova retaining the same shape and form which they had at the time the infection took place.

The preventives of the disease are numerous, and most of them within the reach of our farmers. They are generally such as are calculated to destroy any noxious quality adhering to seed grain, be it the seeds of minute parasitic plants or of animalcula. Tull has related, that the use of salt brine as a pickle was discovered by the sowing of wheat steeped in salt water, and which escaped smut, when nearly all the wheat in England was affected. A solution of nitre, copperas and potash, in the proportion of eight pounds to 100 pints of water; arsenic; a decoction of tobacco, hellebore powder and aloes; a mixture of water, wood ashes, alum, vitriol and verdigris, boiled for an hour, have been all recommended with confidence. In Norfolk, England, the salt is dissolved in a small quantity of water, just sufficient for the purpose; lime is slaked with this solution, and the wheat is dried with it in its hottest state, having been previously moistened with pure water. In Yorkshire one ounce of white arsenic, finely powdered, is boiled in a gallon of water for two hours, and stale urine is added to increase the quantity to two gallons, then the wheat is steeped in the liquor and encrusted with quick-lime. In parts of England and Scotland, stale urine, free of any mixture, is generally used; and in a practice of forty years, Messrs. Culleys used this preparation, and never had any smut. Mr. Donaldson made sixteen experiments with seed impregnated with smut powder, and sowed some without any preparation, and the residue steeped in preparations of arsenic, vitriol, chamber ley and lime. That sown without preparation was one-half and five-sixths (being two parcels) smutty, while that steeped in chamber ley and limed had but one smutty ear in forty-six. Mr. Bauer expresses a strong conviction, from repeated experiments, that steeping the seed in properly prepared lime-water, for at least twelve hours, and then to dry it well in the air before sowing it, is the surest way to prevent smut.

It is the practice of many of our farmers, to steep the seed grain in lime-water, and though it does not wholly prevent smut in all cases, it certainly has a highly salutary effect in lessening the evil. Our practice has been, to steep the seed twelve hours in salt pickle, and then encrust with quick-lime; and when we have adopted this course no smut has been perceptible. Wherever experiments are make with steeps, it is well to sow a quart or two of seed without any preparation, the better to test the benefits of the steep. We hope our farmers will test the efficacy of steeps with their seed grain, and particularly those of lime and salt; and if they will make accurate notes, and communicate to us, after the next harvest, the result of their experiments, not only in regard to smut, but the grain worm, we may hope to make the Cultivator the medium of much useful information upon these important subjects.

We repeat the admonition, to use fresh burnt lime, where practicable. Lime long exposed to the atmosphere loses in a great measure its causticity; by absorbing carbonic acid, it is restored to the state of lime-stone or chalk, and its alkaline qualities ar completely neutralized.

COMPARATIVE VALUE OF ROOTS FOR FATTENING FARM STOCK.

The Agricultural Society of Scotland awarded to Andrew Howden, in 1832, a premium, for a report of experiments on the comparative advantages of feeding stock with mangel wurzel, turnips and potatoes. We abstract the result of the experiment for the Cultivator, from the Prize Essays of the Society.

Mr. Howden, with a view to the experiment, set apart the products of two acres of mangel wurzel, amounting to fifty tons, five acres of Swedish turnips, being 140 tons, and two acres of potatoes, weighing 29 tons 4 cwt. The experiment was made with 21 head of cattle, which received, in adddition to the roots, a few distiller's grains and a little straw. The following table shows the roots appropriated to each lot, and their monthly increase in girth.

		Lot No. 1, from one acre of potatoes, one acre of mangel wurzel, one acre of Swedish turnips.	Lot No. 2, from one acre potatoes 2, acres Swedish turnips.	Lot No. 3, from one acre mangel wurzel, 2 acres Swedish turnips.
1831,	Nov. 30,	35 ft. 8 inches,	35 ft. 9 inches,	35 ft. 8 inches.
	Dec. 30,	36 " 6 "	36 " 7 "	36 " 6 "
1832,	Jan. 30,	38 " 2 "	38 " 4 "	38 " 2 "
	March 1,	39 " 7 "	39 " 8 "	39 " 6 "
	" 30,	40 " 8 "	40 " 10 "	40 " 6 "
	April 30,	41 " 4 "	41 " 7 "	41 " 3 "

Twenty-eight tons of Swedish turnips and mangel wurzel withdrawn and fed to other stock.

On the 30th of Jan. Mr. Howden took a pair of cattle out of each lot, and fed No. 1 with potatoes and water, No. 2 he fed with Swedish turnips, and No. 3 with mangel wurzel. The following shows their relative increase in girth in three months.

		Lot No. 1. potatoes.	Lot No. 2. Swedish turnips.	Lot No. 3. mangel wurzel.
1832,	Jan. 30,..	10 ft. 8 inches,	10 ft. 5 inches,	10 ft. 4 inches.
	April 30,..	11 " 6 "	11 " 3 "	11 " 2 "

When the cattle were sold, the purchasers ageed that the lot fed on Swedish turnips were from 7 to 10s. a head better than the other lots. The average advance upon the original value of each was £6 12; and the cost of grain being deducted, there remained £120 ($532.80) in return for the eight acres produce consumed. This is no bad evidence of the profits of root culture, in the fattening of cattle; and we hope it will help to extend this culture among us.

MANURES.

Manures are the food of plants. They are to the vegetable what grain and hay are to the animal kingdom—the materials which give growth and profit. Every vegetable and animal substance is susceptible of being converted into the food of plants; and should be as carefully husbanded by the farmer, as the food destined to sustain and fatten his farm stock. From these considerations we have devoted a portion of the Cultivator to this branch of improvement; and we intend to extend our remarks, occasionally, to the various matters which are employed as manures, or which are available to our farmers. In doing this we shall avail ourselves of the experience of others, together with such hints as our own practice may suggest.

Salt.—Much has been said in favor and against the use of salt in imparting fertility to lands. In the Farmers' Series of the Library of Useful Knowledge, numerous experiments are cited, in many of which the application was of manifest advantage, not only in imparting fertility, but in destroying noxious insects and noxi-

ous weeds; in many other cases it produced no sensible effect, particularly in enriching the soil. The quantities that have been experimented with have varied from four to forty bushels the acre; and the kinds have also been different—some using refuse and others pure salt. The first is considered about half the strength of the latter. On the application of forty bushels of pure salt to the acre, vegetation ceased; one-half of this quantity destroys slugs and insects in the soil. From the great mass of testimony examined, the editors come to the conclusion,

"That nothing decisive has been ascertained regarding either the quantity or the season in which salt should be laid upon the land. It appears, however, that its effects are most visible and satisfactory when applied to hot dry soils, and in very warm summers; but on cold wet land, and in rainy seasons or under a humid climate, its powers seem to become neutralized, and of little value. We are of opinion that, on arable land, it will be found more advisable to lay it on before sowing, than either with the seeds, or afterwards as a top-dressing. If applied, for instance, to a clover lay, either a few weeks before seed time, or immediately after the first crop is off, it would effectually banish the slug; and it has been justly observed, that if all stubbles (not laid down with seeds) were to receive a slight dressing of salt before winter, it would not only tend to keep the land free from the slug, but probably otherwise benefit the soil."—p. 387.

The quantity of pure salt recommended on the acre, is from four to sixteen bushels. The best way of applying it is in the form of composts. It is mixed with earth, or with earth and lime, the mass turned occasionally and incorporated, till the salt has mostly dissolved, and then applied generally as a top-dressing. Hollingshead, who has published a volume of facts in favor of using salt, says a slight annual application will keep the land in a state of the greatest fertility. When a large quantity has been put on it has destroyed vegetation for a time; but afterwards, when the salt has been well dissolved and mixed with the soil, the land becomes very rich. This latter opinion is confirmed by Von Thaer, the principal of the great Prussian Agricultural School, and the first authority, who also says, that on rich land, when spread in small quantities, it produces, very sensibly, favorable effects, though of short duration; but if laid upon a poor soil, in an equal quantity, it has been found wholly ineffectual.

We have not introduced these remarks with a view of recommending the use of salt in our agriculture; for we deem the expense too great, and the benefits too precarious, for our present practice; but our object is rather to furnish useful hints, suggested by the experience of others, to those who may choose to experiment with it.

Nitre or Salt Petre.—Numerous experiments are detailed, in the work from which we quote, of the effects of nitre in husbandry. It is applied in quantities of 1 cwt. to 1½ cwt. per acre, as a top-dressing, on most soils, and has been found to be highly beneficial to wheat, oat and grass crops. Its benefits are greatest upon clays and stiff loams. It is said to prove destructive to wire-worms, slugs and other insects. We are furnished with no data to decide whether its benefits have been equal to the cost. The price of crude India salt petre, on the sea-board, is six to eight dollars per hundred weight.

Bones, Horns, &c.—Bones are in great demand, in Great Britain, as a manure; and great quantities are annually imported into that kingdom, from the continent, for this use. They are broken in mills constructed for the purpose, and often upon the farm, by the laborers. Bone dust ordinarily sells at about 2s. or 44 cents, and sometimes as high as 3s. 6d. per bushel; and at this price it is generally found to be a more profitable application than common dung. Bones are frequently applied, and by many preferred, when broken in half or three-quarter inch pieces, and sometimes when of larger size. Their durability is in proportion to their size; the smaller they are crushed or ground, the sooner their fertilizing properties are exhausted—and the less the quantity required to be applied. They have been applied in various proportions; though the ordinary dressing is from twenty to forty bushels per acre; a heavy dressing does not produce corresponding benefits, and in most cases, no additional benefit. Two bushels of crushed bones are deemed equal to a load or ton of manure. The uncrushed bones are sold at about 42s or from nine to ten dollars the ton. Their quality is not considered to be impaired by their having been boiled. Bones are applied as a top-dressing to grass, and harrowed in with the grain in tillage crops. The following results are selected from a great many, to illustrate the benefit and economy of bone manure.

On the estate of Garrowby in Yorkshire, the crops of turnips had dwindled to nothing; by the application of 12 to 20 bushels bone dust per acre, in drills, the crops have become excellent, and the following crops are very considerably improved.

At Clumber Park, 600 bushels, spread upon twenty-four acres of pasture, a dry, sandy and gravelly soil, doubled the product, in butter, of the cows pastured upon it, over those fed upon pasture not boned.

Mr. Watson, of Riellor, applied twenty-five bushels of bones to an acre of turnips, and twenty-five loads of manure to an adjoining acre. The dunged acre yielded twenty-two tons; that dressed with bones twenty-eight tons.

Mr. Graburn manured part of a field with crushed bones, at the rate of thirty bushels the acre, and another part with eight loads of dung, and repeated the dung the two following years upon this part. The turnips, wheat and grass, which constituted the three crops, were better upon the part once boned, than upon that thrice dunged.

Thirty-four acres of sandy soil, on the estate of Sir Charles Thockmorton, were half manured with bones and half with dung. The first gave the earliest and best turnips; the barley which followed yielded five bushels the acre more than the dunged part, and the clover was also heavier upon the boned part.

Capt. Ogilvie applied bone dust at the rate of 15 to 20 bushels the acre, to a light sandy loam, and after the experience of five years upon a series of trials, he found all the successive crops of turnips, barley and grass, decidedly superior to those which had been previously produced by other manure.

Twenty bushels of bone dust, at 2s. 6d. would be 50s; twenty loads manure at 10s. the price given in the statements, would amount to 200s. which shows a saving of three-fourths in manuring an acre with those substances, at the assumed prices, and in the assumed quantities.

The two following cases, taken from the Doncaster report, are worthy particular notice:

"1. On a field, part of which was boned forty years ago, the crops were, on that part, during fifteen or sixteen succeeding years, visibly better than the remainder, although the land was all of the same quality, and the part not boned was manured with barn-yard dung.

"2. In another case, about three acres of light sandy land were dressed, in 1814, with 150 bushels of bones per acre; since which time the land is said never to have forgotten it, but is nearly as good again as the other part, farmed precisely in the same way, with the exception of the one application of bones."

As to the size in which bones are most profitably applied, one of the Doncaster association remarks—"That if he meant to till for early profit, and if he wished to keep his land in good heart, he would use half inch bones; and, in breaking these, he should prefer some remaining considerably larger: that by using bones of a large size with dust in them, there must be sufficient of the small particles of the dust to set the turnip crop forward, and sufficient of the large particles of the bone left to maintain the land in good condition for the subsequent crop.

Bones are found on analysis to contain, in 100 parts, 40 of earthy and saline matter, 40 of cartilage and jelly, and 20 of fatty matter. The soft parts thus form, in the best bone about sixty, and upon an average about fifty per cent, which are almost entirely constituted of the same elements as plants, and all of them, sooner or later, liable to be dissolved and absorbed by the roots.

Bones should undergo a partial fermentation before they are applied, in order to produce the best immediate effect. This is done by mixing them with yard manure, or with manure and earth. They have also been mixed and applied with coal ashes with effect and economy.

The Doncaster Agricultural Association, after long experience in the use of bones, have published rules for its application, from which it appears,

That on dry sands, lime-stone, chalk, light loams, and peat, bones are a very highly valuable manure.

That they may be applied to grass with great good effect.

That on arable lands they may be laid on fallow for turnips, or used for any of the subsequent crops.

That the best method of using them, when broadcast, is previously to mix them in a compost with earth, dung, or other manures, and let them lie to ferment.

That if used alone they may be either drilled in with the seed or used broadcast.

That bones which have undergone the process of fermentation are decidedly superior (in their immediate effects) to those which have not done so.

That the quantity should be about twenty bushels of dust, or forty bushels of large, increasing the quantity if the land be impoverished.

That upon clays and heavy loams, it does not yet appear that bones will answer. *See No. 55 Farmers' Series.*

And where, it will be asked, are we to obtain bones to enrich our lands? Every farmer, we admit, cannot obtain them; but those who are located in the neighborhood of villages and cities may obtain a considerable supply. There are two bone-mills already established on Long Island, and it is understood the proprietors find a ready market for all they can crush. During the last year we purchased sixty horse-cart loads from one man. We had them crushed in a plaster mill; and when about to use them, mixed them with house ashes, and wet the whole plentifully with water. In 48 hours, fermentation having sufficiently progressed, they were applied to turnips, barley and corn; and though we cannot yet speak of their ultimate benefit, they so far confirm the highest opinion entertained of their utility.

We have had some years experience in the use of horn shavings and horn piths, which are procured from the comb manufactories. The first, of which we have used many hundred bushels, are equal, if not superior, to bone dust. The piths are cut into pieces, upon a block, and buried with the plough. Of these we used fifteen loads last spring, upon corn ground, and we think we have not seen a finer crop than is now growing there.

CORRESPONDENCE.

Erie County, July 28, 1834.

Being one of your subscribers, and having been much instructed by the perusal of the Cultivator, I take the liberty of addressing you on a subject of great importance to many of the farmers and land-holders in the western parts of our state. We find large tracts of land composed of *vegetable* matter *only*, and covered with a dense growth of alders, with here and there a soft maple. This vegetable matter is generally from four to six feet deep, and covering old logs, trees, roots, &c. in a good state of preservation.—These lands were once no doubt covered with water, and are at this time more or less overflowed in the spring and fall freshets, especially those lands in the vicinity of the Tonawanda creek, and known as the "*Tonawanda Swamp.*"

My great object in this communication is to respectfully solicit from you an answer to the following questions:

1. I would ask information in regard to the best manner of draining those lands, and the width and depth of the drains?

2. The most approved plan of clearing those lands, having in view the expense, and also the burning off the growth of alders, so that the soil, or vegetable matter may not be burned?

3. Whether manure, lime, or sand is necessary to be mixed with the vegetable deposite, in order to bring about decomposition; which is the most preferable, and the quantity of each per acre?

4. What crops can be cultivated to the best advantage on these lands, having in view the greatest profit?

I fear I am trespassing too much upon your patience by my numerous queries; but although they may seem trifling to you, they are of great importance to some of our western farmers and proprietors of many acres of these lands now lying idle, and which, if brought to a state of cultivation, might be very productive.

The reason why these *swamps* continue to remain in their *swamp character*, may with great truth be attributed to the ignorance of the farmers in regard, not only to the value of those lands, but to the *manner* and *mode* of clearing and cultivating them. Among these *illiterate swamp owners*, I freely acknowledge myself one, and my pride does not prevent me from confessing my ignorance, nor my delicacy from asking information of the experienced and scientific.

While I am on this *agricultural* subject, permit me to congratulate you on the success and encouragement attending the circulation of the Cultivator; and much more may I be permitted to congratulate my brother farmers that an opportunity is afforded them of reading the pages of your valuable paper, and of laying up in store a vast fund of information in no other work to be found.

I am truly yours, TONAWANDA.

REMARKS BY THE CONDUCTORS.

Our correspondent has imposed upon us a difficult task,—because we feel incompetent to answer his queries satisfactorily, without a local knowledge of the grounds to be improved, and of the quality of vegetable matter, whether, peat, moss or bog-soil,—of their extent, and the nature of the subsoil, &c. which we do not possess. If we succeed, therefore, in suggesting any useful hints, or in eliciting such from better informed sources, we shall be amply repaid for our labor. With this apology, we shall proceed to remark upon the several queries, in the order they are put to us.

1. The vegetable matter described, is manure, calculated, under a proper system of management, to afford an almost inexhaustible supply of food for cultivated crops. But in order to render it the food of vegetables, decomposition must be induced, first, by a complete drainage; and should this prove insufficient, second, by the admixture of such matters as will bring about the desired result. Heat and air are essential to the decomposition of these vegetable matters. While the vegetable matter continues saturated with water, these agents are in a measure excluded: For had they exerted their accustomed agency, this vast quantity of peaty matter would not have gone on accumulating to the extent it has perhaps for centuries. The first object, therefore, is to get rid of the surface, or the surplus water, by draining, Open drains can alone be depended on, till decomposition has somewhat progressed, and the ground become more firm and compact. If there is any fall, by which the water may be carried off, the lowest point should be selected for their outlet. If there is not sufficient fall, the drains must be of a capacity to receive and contain the surface water.—Many of the grounds in Holland are lower than the surface of the ocean, the waters of which are excluded from them by embankments. The waters which collect in these grounds cannot be drained off, but are received into canals or ditches which intersect the grounds at convenient distances. In these the water rises nearly to the surface, and yet they afford some of the finest pastures in the world. In Flanders, and in this country, large tracts of marsh have been reclaimed from the ocean by embankments, which are of great fertility and value. In the case under consideration, the principal drain should pass through the lowest ground, or centre of the piece intended to be improved, if no inequality of surface exists; and its size should be proportioned to the area of the surface to be drained, and the quantity of water which it may at any time be required to receive or convey. It will require to be from 6 to 20 feet broad on the surface, according to the extent of the swamp and the abundance of water, and from 2 to 8 feet at bottom, the sides sloping 45 deg. or more, to prevent their falling in and obstructing the water, or filling up the drain. It should be sunk down to the solid earth under the vegetable matter, if practicable, and it were better to penetrate this a foot or more. The earth taken from the drain should be thrown back, and not suffered to press upon the sides. Having completed the centre drain to the extent required, proceed to cut drains round the parts to be improved, terminating them in the main drain, to prevent the access of water from adjoining grounds, of such dimensions as shall answer the intended purpose, but never less than four feet broad at the surface. Experience has taught me, that to make shallow or narrow drains in grounds like these, is a waste of labor. The water coming from adjoining high grounds, may in most situations be collected by cutting a horizontal ditch above the level of the swamp, so as to intercept all the hill springs, and conducted into the main drain. If springs exist in the swamp, they must be intersected by drains, which may be covered, leading to the open drains. If found necessary, after the ground is cleared, lateral drains must be made at such intervals as will completely free the surface from too much moisture. Where the fall will permit it, the outlet is often dug 15 or 20 feet deep, when found necessary to draw off the surplus water. When grounds are compact, under drains may be substituted for open lateral ones, in a tenacious subsoil. For these stones are the best material; the most approved method of constructing which, we have noticed in another column of the Cultivator, under "*draining.*"

2. Having made the central and exterior drains, proceed to clear the surface of the ground of bushes and logs; and as there are represented to be no large trees, take up roots and all, which will be literally paring it, as the roots, in such situations, spread near the surface. The best instrument to effect this is a broad edged grubbing hoe; and if the ground is sufficiently firm, the work may be greatly facilitated by a yoke of oxen, which with a chain fastened around the bushes will pull up large masses at a haul, I should not think it would cost more than four or five dollars an acre to perform this operation; but if it costs double this, the money is well laid out. Where the growth is dense, there will be no difficulty in burning over the whole surface, which is desirable; the fire will contribute amazingly to ameliorate the soil, and with the ashes probably fit it for a first crop, which may be put in, with grass seed, with a harrow. There is no danger of injuring such a soil by burning, except in unusual dry weather. Its fault is an *excess* of vegetable matter.

3. If draining, paring, and burning do not induce fertility, and a wholesome vegetation, which however they probably will do, lime, or unfermented manure, or sand, may be employed to bring on a fermentation. The quantity of these required will depend upon the quality of the vegetable matter,—the finer this, and the freer it is from woody matter and moss, the less will be required. If feruginous matter abounds, (oxide of iron) which is indicated by a red colour, lime will answer the further purpose of destroying its baleful effects. Experiment can only determine the quantity of either that will be wanted, though we think neither of them will be required, where there is already a dense growth of alders and scattering soft maples. Next to lime, unfermented manure will best facilitate decomposition. The lime should only be harrowed upon the surface; the manure should be buried with the plough.

4. Grasses will constitute the best crop for some years, and perhaps permanently, with an occasional alternation of tillage crops; and indeed we have little doubt that many of these will spring up spontaneously and abundantly, when the surface has been burnt, particularly the white and red top, and other of the agrostic family, and also the poas. Of tilled crops, oats and potatoes, and where dung is employed, Indian corn, I have found to do best in reclaimed swamps. When properly drained, the vegetable mass soon begins to decompose and become compact, and the latter is aided much by the tread of cattle dispastured upon it. The grasses which come in spontaneously embrace some of the most nutritious kinds. I had two acres of this kind of land, which has been drained some years, in potatoes in 1833. This spring I had omitted to put in a crop till I found it was likely to be coated with grass, which I suffered to grow, and ten days ago cut from it more than an ordinary crop of good hay, although no seed had been sown.

Miscellaneous. What are called *carses* in Scotland, were originally very similar to the Tonawanda swamps, with a sub-soil of clay, They are now rated best lands; and the vegetable matter having been principally decomposed, or blended with the earths, the soil has become firm and tenacious, so as to admit of under-draining with great benefit. Vast areas of bog, moss and fen lands have been reclaimed, and are now being reclaimed, in Scotland and Ireland by draining and paring and burning, though at great expense, yet with great ultimate profit. In some instances in this country, where the large roots and stumps have been got rid of, the scraper has been successfully used to throw swamp lands into ridges, and in excavating the drains.

Albany, August 11, 1834.

Dear Sir—Agreeable to your request, I send you some account of the method of curing hops, are practised by the most successful persons I have known in that business, and also take the liberty of pointing out some of the common faults our western and eastern hop raisers fall into. There are so very few hops that are brought to our market of a prime quality, which makes it one of the most disagreeable tasks to select a supply, from the large quantities that are offered for sale; and it is truly lamentable to see the immense sacrifice of property from the want of care or skill in their management.

It may not be improper to premise, that hops, to be productive require a rich soil, an airy situation, as well as occasional manuring; even the best lands ought to have, every two or three years at farthest, from thirty to forty loads of well rotted barn yard manure to the acre: and although the wild hop is generally found on the banks near water, yet hops thrive well on almost any good land if properly attended to.

The time of picking hops varies—light soils or elevated and dry situations are earliest; even in a yard of a few acres, situated on a side hill, the highest ground is often ready for picking some days before the lower; and sometimes from the poverty of the land, the middle, or it may be, the lower part is ripe first. In commencing picking, too much care cannot be taken in gathering those first that are *ripe*, and not in picking those that are *largest*, as is often the case. The time of picking may be known by their change of colour, from deep green to a light yellow tinge. If they have seeds, the hop ought to be gathered as soon as the seed turns brown; but the certain indication of picking time, to those who are familiar with this article, is when the *lupulin*, or small globules of the bright yellow resin, are completely formed in the head of the hop, at the bottom of the leaves, and the leaves are readily rubbed from the stem. The lupulin (or flower of the hop as it is commonly called) is the only valuable part, and if gathered too early, before it becomes perfect turpentine, it soon dissipates and loses its fine aromatic flavor and all its medicinal qualities. Hence, gathering hops too soon is a total loss, and instead of imparting a palatable, pleasant flavor, and giving its fine tonic balsam to ale, they are unquestionably an injuiry, and ought not to be used; and if gathered too late, the lupulin drops out, and the hop is of no value; but the experienced cultivator takes the medium, commences when the hop is first ripe; has every thing prepared—his hands, kilns, baskets, baggings, &c. Five or six days ought to finish the whole process of picking and curing, if his yards ripen about the same time. The hop should be picked clean, without leaves or stems, and if possible without dew on them, nor *pressed to close* nor put in *too large quantities*, before going on the kiln, or they will *heat*. No rule can be given for the thickness they ought to be spread on the kiln, or even for the length of time necessary to dry them. A skilful operator is the only safety in this process. Care ought to be taken that the kiln draws well, as much depends upon its draft—the steam should not be allowed to fall back on the hops, and must pass off freely.

Preparatory to putting the hops on the kiln, it must have a fire put in, made perfectly dry, and fumigated by burning brimstone to take away all the bad smell, and when perfectly sweet, a layer of hops put on, say eight or ten inches deep, and this may be increased or lessened as the operator finds the draft. The time used in drying will also depend on the quantity of hops on the kiln, and on the draft, say from eight to sixteen hours; but they must not be removed from the kiln, until the core or stem of the hop is crisp and well dried, they must then be put upon a floor, and occasionally turned, until the leaf becomes tough, when they are ready for bagging.

The fuel used for drying, must be of the sweetest kind, and *perfectly charred*, and the best is beech, birch, hickory or maple. Pine may not be used under any circumstances, nor any brimstone, only as before directed. When the fire is once put to a kiln of hops, it must never be permitted to slacken or go out, until they are dried. The fire should never be so hot as to burn or leave the least taint of fire on them.

I would suggest to all our hop raisers a system to be *adopted and never deviated from*—that is to divide very carefully the hops into three equal parts or parcels, the first, second and last pickings.—If six days are consumed in picking, let the hops of the two first days, the third and fourth days, and the two last days, be kept separate, bagged and marked; each parcel will by this method be more valuable to the brewers, and enhance the price of those that should thus be brought to market if skilfully picked and cured. It would also be a good regulation, to have all our hop raisers put as near as may be, 220 pounds in each bag, and have all the bags of about one size, say five feet long, two feet wide, and eighteen inches thick—this would be more convenient for the brewer, but particularly so for shipping; and should we be so fortunate as to rescue our hops from their present degraded condition, they will soon be one of our principal articles of commerce. In a letter I received a few days since from a Havre merchant, he remarks, "the American hops are of all qualities, from the Vorgue refuse, to the delicious fragrant German; and if you could establish for yours the reputation of the latter, they would command the market."—

There is not perhaps amongst the whole range of resins, one so delicate, rich and powerful an aromatic as the hop, nor one more easily destroyed by improper treatment; nor is there another article of produce or manufacture so little understood and so unskilfully managed.

In connection with two of the largest brewers in the country, we purchased in the Boston market, last fall, a quantity of hops, and in the first shipment of about *two hundred bales*, there was not, after a careful examination, jointly, over *twenty-five bales* that ought to have been used, and all those were injured by being picked before they were ripe. This is not an individual instance; it is a prevailing evil, and of the total amount brought to Albany, speaking within bounds, more than one-half are destroyed or injured by early picking. This evil ought to be at once remedied; but let me caution your raisers not to run into the opposite extreme, and pick them as much too late.

For the last fifteen years, I do not recollect a season, but repeated instances have come to my knowledge, where the farmer has totally lost his crop by having it heated from neglect in not drying them well on the kiln.

How truly mortifying, when the farmer presents his hops, the fruits of a season's anxiety and labor, to be told they are scarcely fit for manure. I do know some men, whom I esteem as men of sense in other matters, year after year bringing their damaged goods for sale, in every other respect a splendid article, and having them heated, and this, after each year's repeated advice and caution. Of the amount of loss from this source, it would be difficult to form an estimate; it is, however, large. There are more hops injured from partial drying, in seasons when the crops are abundant, than in ordinary years, by not having kiln room enough, hence they are hurried off undried; this evil is easily corrected by having always rather too much than too little kiln room; the additional expense is trifling.

The next serious injury from want of skill in curing, is that of scorching or burning the hops on the kiln. There are large quantities, every year, of western hops destroyed or partially injured in this way. Our eastern hop raisers are far before those of our state in curing them on the kiln. Scarcely an instance of scorching on the kiln, of heating after being bagged, is known amongst them, and the fault with us must be want of care or skill.

The hops of this state, as a whole, are not cleanly picked, and are often injured by having them heated before going to the kiln. Many have their kilns so low, that the steam does not go off, consequently the hop is stewed in its steam, and by this means materially injured. A common practice of using coal, partially charred, smokes the hops, and their rich flavor is materially injured, and often totally destroyed. That we may not forget, let us recapitulate our grievances: About one-half our hops are injured by picking before ripe, (our eastern hop raisers do more injury in this respect than our western farmers;) another part are injured by partial drying, and bagging them in that state; another part are scorched or burned; some are heated before going on the kiln; some stewed on the kiln; some smoked; some gathered with the leaves and vines; some send us brimstoned hops, and a few good fellows bring us as fine hops as any part of the world can boast of, and they ought all of them, or nearly so, to be of this fine quality.

Let our farmers make exertions to cure their hops as well as our eastern friends, and their hops will find the readiest market and the best price, and will, intrinsically, be near double the value of the eastern, or until the eastern raisers let their hops ripen before they are gathered. It may be justice to our friends of the east to state, that the fault of picking their hops too soon, (and this is their only fault,) has been the mistaken advice of the hop inspector, who has branded the ripe hops as *seconds*, and those which were *refuse*, from being picked too early, he has branded *firsts*. I have often, some years since, remonstrated with the inspector on the injustice of his branding the refuse as firsts, and the firsts as seconds. He admitted, in his opinion, the course he was pursuing was wrong, but some pale ale brewers had advised him to brand the pale hops as first, to encourage the picking early. These ill-omened men have done incalculable mischief, and an evil that will take years to repair. There are, and it is to be regretted, but few brewers who are good judges of hops. I have not, however, conversed with an individual, even of my own brethren of the pale ale stamp, who has not admitted the propriety of all I have advised. I must again repeat, that hops too early picked, are the worst refuse we get; they are totally destitute of the only valuable part, the resin or lupulin. The hop is gathered before it is formed, having only a sort of sap: not only the smell, but also every appearance of lupulin is soon dissipated.

In submitting these brief remarks for the consideration of those interested, it is with a sincere hope that all will unite cordially in endeavoring to place the reputation of the hops of America as the best in the world.

I am, very respectfully yours, &c.

J. BUEL, Esq. L. FIDLER.

Hamilton, Madison co. August 2, 1834.

SIR—I have been looking, for some time past, in the Cultivator, for a communication from Mr. Fidler, or some of our hop growers, relative to hops; not finding any, I have presumed to send you a few observations of my own.

It is said, and perhaps truly, that our western hops are not as good as the eastern; if so, I think it highly important that we learn the cause or causes, and remedy the defect, that the reputation of ours may compete with theirs, or even with the European.

I have been in the hop growing business about fourteen years, and have had some experience therein; but fearing I shall extend my remarks beyond the limits of the Cultivator, (if thought worthy a place therein,) I shall not speak of their cultivation, or of the different kinds, but of their curing, (the time of gathering being near.) It is necessary, however, that hops be picked clean from stems and leaves. Every hop grower should have a kiln of his own, and it is of the first importance that the cloth on which they are to be dried should be of suitable thickness. The cloth which I now use, placed about seven feet from the bottom of the cell or cavity, was all made of coarse linen yarn, wove in a slate of twenty-six, with one thread in a reed, which I think to be a good one.

The drying of hops requires experience as well as care and attention. Many go into the business for a year or two; not being very successful in growth or curing, and consequently in price, they relinquish it; others succeed them in the same path, with the like effect, which operates materially against the general reputation of our western hops. I would recommend to persons who commence in the hop business to persevere and pursue it, and in the first place obtain information relative to their proper management, and particularly the curing of them.

Obtain some person of experience, in drying, even at almost any price, attend closely with him, observe the light, loose manner in which they are spread upon the kiln cloth, and more particularly the temperature of the air within the kiln, and in a few days you can manage them yourself in good weather. In wet weather, it is almost impossible to dry them and have them retain their proper colour and flavor, if the same quantity as usual are put upon the kiln.

In drying wet hops, the heat of the fire at the commencement must be reduced at least one-third, to give time for the evaporation of the water they retain, otherwise you heat the water to such a degree that the hops are scalded, wilted, and often scorched before they are dry; stirring them in that situation is of little or no use. When dry they are worth little, but are often, I presume, carefully mixed with those that are good, thus damaging the whole, reducing their value and reputation. This is bad policy; we had better be equally careful to keep them separate from those which are good; press them by themselves, sell them to distillers for what they are worth, which is more to them than to the brewer, and thus retain, or rather obtain, a better reputation for ours.

But more relative to drying. Much depends upon the thickness of hops on the kiln when drying. It is too often the case that we employ more pickers than we can dry after to advantage, even in good weather, consequently we are obliged to place them too thick upon our kilns. The result is obvious; the hop naturally contains a quantity of moisture, the evaporation of which commences at the bottom and necessarily has to pass through the whole thickness, and unless great care is taken, with moderate heat, it becomes too hot and dense, and carries off a great proportion of the aromatic substance of the hop, and often changes its colour. Much, however, depends upon the cloth, as I have before observed, relative to the thickness on which hops may be spread; on a cloth sufficiently open, they will do well six inches in depth, and perhaps some more;

that thickness, however, is greater than I usually practice at the commencement of picking.

I am careful to commence my hop harvest with such a number of pickers as I am sure will not pick more than I can dry well, and do it the same day. My first batch I put on the kiln between eleven and twelve o'clock at noon, perhaps about five inches in thickness, which, if properly attended, will be ready to be taken off about eight o'clock in the evening. I then put on those picked on the previous afternoon, which I attend for an hour or two, and then leave until morning; the kiln, when left, possessing heat sufficient to cause the evaporation so far to take place, that the steam will not settle to their injury; a little fire next day will dry them sufficiently, and leave the kiln in a proper situation to receive the next batch at the same time.

I do humbly solicit our western hop growers to try the experiment of spreading their hops thinner on their kilns, and not ten or twelve inches thick, and consequently twelve hours in drying, with the use of sulphur to preserve their colour, without adding to their substance.

I made use of sulphur in drying one kiln, last year, for an experiment, and believe it to be perfectly useless and unnecessary. I believe we had better employ a few less hands, or extend our kilns, the expense of which would be barely nominal, compared with the profits we should receive, in two or three years, from a few acres of hops. I do not pretend, by these observations, to understand the curing of hops better than many others, and hope to see observations upon the same subject from those of greater ability in every sense of the word. I will, however, presume to observe, that I have never sacked but one bale of hops which an inspector marked as seconds, to my knowledge; my hops have been sold at home for two or three years past, and whether inspected or not I do not know.

WM. LORD.

J. Buel, Esq.

To the Editors of the Cultivator—Permit me, through the columns of your valuable paper, to call the attention of farmers to the importance of under-draining where necessary, and by that means bring all their wet, and now comparatively waste lands, into profitable cultivation. Although wet lands may yield a considerable quantity of grass, yet it is generally inferior in quality; but by properly draining these, they can be made to bear all kinds of grain and grasses, yielding a profit to the farmer equal to the dryest soils. I saw a communication in one of the numbers of the Cultivator, estimating the cost at fifty cents per rod, the drain to be filled with broken stone. But is this the best method? it certainly is not the cheapest, and I think not the best. It is more subject to get filled up with the sand and other substances washing through it, and I think will not drain the land as dry as it will to leave an open passage for the water, by placing round stones, of three or four inches in diameter, where such are to be had, on the sides of the drain, and covering with flatter ones. This method, to the operative farmer, will not cost to exceed thirty-one cents per rod. The trench ought not to be less than two feet deep and fourteen inches wide, the sides pared down straight, leaving the middle a little higher than the outer edges, that the stones may incline outward against the bank rather than inward, as the water is continally washing out the centre. One of our neighbors recently opened one of his drains for examination, which was put down six years ago, in the manner above described, and found the passage as clear as the day it was put down, and I think must ever remain so, as the current of the water will always keep it open.—The benefit to be derived from under-drains must be obvious to every one. Where parts of a field are wet by this means, the whole may be brought into cultivation, and in many instances, making excellent watering places worth double the amount expended in their construction. Respectfully,

GEO. WILLET.

Skaneateles, Onondaga, co. N. Y. 8 mo. 1834.

Science of Agriculture.

SUPPLY OF FOOD BY MANURES AND CULTURE.

With regard to the food of plants derived from the atmosphere, the supply is pretty regular, at least in as far as the gases are concerned; for they are not found to vary materially in their proportions on any part of the surface of the globe; but the quantity of moisture contained in the atmosphere is continually varying, so that in the same season you have not always the same quantity, though in the course of the year the deficiency is perhaps made up. From the atmosphere, therefore, there is a regular supply of vegetable food kept up by nature for the support of vegetable life, independent of the aid of man: and if human aid were even wanted, it does not appear that it would be of much avail. But this is by no means the case in regard to soils, for if soils are less regular in their composition, they are at least more in the reach of human management. The supply of food may be increased by altering the mechanical or chemical constitution of soils; and by the addition of food in the form of manures. The mechanical constitution of soils may be altered by pulverization, consolidation, draining and watering; their chemical properties by aeration and torrification; both mechanical and chemical properties, by the addition of earths and other substances; and manures, either liquid or solid, are supplied by irrigation and distribution of dungs and other nourishing matters, with or without their interment.

Soils in a state of culture, though consisting originally of the due proportion of ingredients, may yet become exhausted of the principle of fertility, by means of too frequent cropping; whether by repetition or rotation of the same, or of different crops. In this case, it should be the object of the practical cultivator, to ascertain by what means fertility is to be restored to the exhausted soil, or communicated to a new one. In the breaking up of new soils, if the ground has been wet or marshy, as is frequently the case, it is often sufficient to prepare it by means of draining off the superfluous and stagnant water, and of paring and burning the turf upon the surface. If the soil has been exhausted by a too frequent repetition of the same crop, it often happens that a change of crop will answer the purpose of the cultivator; for although a soil may be exhausted by one sort of grain it does not necessarily follow that it is also exhausted for another. And accordingly the practice of the farmer is to sow his crops in rotation, having in the same field, perhaps, a crop of wheat, barley, beans and tares in succession; each species selecting in its turn some peculiar nutriment, or requiring, perhaps, a smaller supply than the crop that preceded it. But even upon the plan of rotation, the soil becomes at length exhausted, and the cultivator is obliged to have recourse to other means of restoring fertility. In this case, an interval of repose is considerably efficacious as may be seen from the increased fertility of fields that have not been ploughed up for many years, such as those used for pasture, or even from the walks and paths in gardens where they are again broken up. Hence also the practice of fallowing, and of trenching or deep ploughing, which, in some cases, has nearly the same effect.

The fertility of a soil is restored, in the case of draining, by means of its carrying off all such superfluous moisture as may be lodged in the soil, which is well known to be prejudicial to plants not naturally aquatics, as well as by rendering the soil more firm and compact. In the case of burning, the amelioration is effected by means of the decomposition of the vegetable substances contained in the turf, and subjected to the action of the fire, which disperses also a part of the superfluous moisture, but leaves a residue of ashes favorable to future vegetation. In the case of the rotation of crops, the fertility is not so much restored as more completely developed and brought into action; because the soil, though exhausted for one species of grain, is yet found to be sufficiently fertile for another, the food necessary to each being different, or required in less abundance. In the case of the repose of the soil, the restored fertility may be owing to the decay of vegetable substances that are not now carried off in the annual crop, but left to augment the proportion of vegetable mould; or to the accumulation of fertilizing particles conveyed to the soil by rains; or to the continued abstraction of oxygen from the atmosphere. In the case of fallows, it is owing undoubtedly to the action of the atmospheric air upon the soil, whether in rendering it more friable, or in hastening the putrefaction of noxious plants, or it is owing to the abstraction and accumulation of oxygen. In the case of trenching or deep ploughing, it is owing to the increased facility with which the roots can now penetrate to the proper depth, and thus their sphere of nourishment is increased. But it often happens that the soil can no longer be ameliorated by any of the foregoing means, or not at least with sufficient rapidity for the purposes of the cultivator; and in this case there must be a direct and actual application made to it of such substances as are fitted to restore its fertility. Hence

the indispensable necessity of manures, which consist principally of animal and vegetable remains that are buried and finally decomposed in the soil, from which they are afterwards absorbed by the roots of the plant, in a state of solution.—*Enc. of Ag.*

Plants are nourished in some degree analagous to the animal economy. The food of plants, whether lodged in the soil, or wafted through the atmosphere, is taken up by introsusceptions, in the form of gases or other fluids: It is there known as their sap; this sap ascends to the leaves, where it is elaborated as the blood of animals is in the lungs; it then enters into the general circulation of the plant, and promotes its growth, [of the roots as well as of the branches, seeds and fruits.]—*Ibid.*

Household Affairs.

Corn Starch, we are advised by an exellent house-keeper, is no wise inferior to wheat starch, while it can be made with half the labor and expense. As this is the season for making it, we have obtained from our informant, for the Cultivator,

Directions for making it.—Take thirty good ears of green corn, fit for eating, grate the corn with a large grater, a lantern will do, into a pail of water; turn the whole through a fine metal cullender, or a coarse cloth strainer, to separate the hulls, &c.; then change the water two or three times, to render the starch, which settles at the bottom white and clean; and after the last water is removed, the starch may be cut in pieces, laid out a few days to dry, when it is fit for use, and may be kept any length of time. This quantity will suffice a year for a small family.

To boil meat.—Let the following rules govern. After the water begins to boil, it should be kept boiling till the meat is cooked.—Put the meat into cold water, sufficient only to cover, and to keep it covered during the cooking process. More water than this renders the meat less savory, and weakens the broth. The water should be heated gradually according to the thickness of the article boiled: the larger the piece of meat, the more moderate should be the fire. If the water boils before the meat is heated through, the latter will be hardened, and shrink up as if it were scorched. The slower it boils, the tenderer, plumper and whiter it will be.—Fresh killed meat requires longer boiling, than that which butchers call ripe, and is withal more tough and hard.

Young Men's Department.

BENJAMIN FRANKLIN.

We promised, in our last, to say something more of the rules which Franklin adopted for his guidance in life, and of the manner in which he enforced them. But it is proper first to speak of his early habits of reading and reflection, which were the ground-work of his greatness and fame. His attachment to books commenced almost in infancy. Among those which he first read, he enumerates De Foe's *Essay on Projects*, Dr. Mather's *Essay to do Good*, Plutarch's Lives, and a volume of Addison's Spectator. He subsequently directed his attention to philosophical works. As books were scarce, and his means restricted, his practice was to buy one or more volumes, read and sell them, and with the avails to purchase others; and in this way he contrived to gratify his thirst for knowledge, without infringing on the hours of ordinary labor as an apprentice. This taste for reading continued to exert its influence upon him during life, and led him, at an early day to project the establishment at Philadelphia, of the library which now bears his name, and which contains one of the most extensive and valuable collection of books to be found in our country. But as we would teach others by his example, we will give some quotations in his own words:

"I now had access to better books. An acquaintance with apprentices of booksellers, enabled me sometimes to borrow a small one, which I was careful to return soon and clean. Often I sat up in my chamber the greatest part the night, when the book was borrowed in the evening to be returned in the morning, lest it should be found missing. After some time, a merchant, an ingenious sensible man, Mr. Matthew Adams, who had a pretty collection of books, frequented our printing-office, took notice of me, and invited me to see his library, and very kindly proposed to lend me such books as I wished to read. I now took a strong inclination for poetry, and wrote some little pieces; my brother [to whom he was an apprentice] supposing it might turn to some account, encouraged me, and induced me to compose two occasional ballads. One was called the *Light-house Tragedy*, and contained an account of the shipwreck of Capt. Worthilake, with his two daughters: the other was a sailor's song, on the taking of the famous *Teach* (or Black-Beard) the pirate. They were wretched stuff, in street ballad style; and when they were printed, my brother sent me about town to sell them. The first sold prodigiously, the event being recent, and having made a great noise. This success flattered my vanity, but my father discouraged me, by criticising my performances, and telling me verse makers were generally beggars. Thus I escaped being a poet, and probably a very bad one: but as prose writing has been of great use to me in the course of my life, and was a principal means of my advancement, I shall tell you how in such a situation I acquired what little ability I may be supposed to have in that way.

"There was another bookish lad in town, John Collins by name, with whom I was intimately acquainted. We sometimes disputed, and very fond we were of argument, and very desirous of confuting one another, which disputatious turn, by the way, is apt to become a very bad habit, making people often very disagreeaale in company, by the contradiction that is necessary to bring it into practice; and thence, besides souring and spoiling the conversation, it is productive of disgusts and perhaps of enmities with those who may have occasion for friendship. I caught this by reading my father's books of disputes on religion. Persons of good sense, I have since observed, seldom fall into it, except lawyers, university men, and generally men of all sorts who have been bred in Edinburgh. A question was once some how or other started, between Collins and me, on the propriety of educating the female sex in learning, and their abilities for study. He was of opinion that it was improper, and that they were naturally unequal to it. I took the contrary side, perhaps for dispute sake. He was naturally more eloquent, having a greater plenty of words, and sometimes, as I thought, I was vanquished more by his fluency than by his reasons. As we parted without settling the point, and were not to see one another again for some time, I sat down to put my arguments in writing, which I copied fair and sent to him. He answered, and I replied. Three or four letters on a side had passed, when my father happened to find my papers and read them. Without entering into the subject in dispute, he took occasion to talk to me about my manner of writing, observed, that though I had the advantage of my antagonist in correct spelling and pointing, (which he attributed to the printing-house,) I fell far short in elegance of expression, in method and perspicuity, of which he convinced me by several instances. I saw the justice of his remarks, and thence grew more attentive to my writing, and determined to endeavor to improve my style." P. 13, 14, 15, vol. 1.

"When about 16 years of age, I happened to meet with another book, written by one Tyron, recommending a vegetable diet. I determined to go into it. My brother being yet unmarried, did not keep house, but boarded himself and his apprentices in another family. My refusing to eat flesh occasioned an inconvenience, and I was frequently chid for my singularity. I made myself acquainted with Tryon's manner of preparing some of his dishes, such as boiling potatoes or rice, making hasty pudding, and a few others, and then proposed to my brother, that if he would give me weekly half the money he paid for my board, I would board myself. He instantly agreed to it, and I presently found I could save half what he paid me.

"This was an additional fund for buying books. But I had another advantage in it. My brother and the rest going from the printing-office to their meals, I remained there alone; and despatching presently my light repast, which was often no more than a biscuit, or a slice of bread and a handful of raisins, a tart from the pastry cook's and a glass of water, had the rest of the time till their return for study, in which I made the greater progress, from that greater clearness of head and quick apprehension which generally attends temperance in eating and drinking.

"Now it was, that being on some occasion made ashamed of my ignorance in figures, which I had twice failed learning when I was at school, I took Crocker's book on arithmetic, and went through the whole by myself with the greatest ease. I also read Seller's and Sterney's book on navigation, which made me acquainted with the little geometry it contained; but I never proceeded far in that science. I read about this time, *Locke on the Human Understanding*, and the *Art of Thinking*, by Miss Du Port Royal.

"While I was intent on improving my language, I met with an English Grammar, having at the end of it two little sketches on the arts of rhetoric and logic, the latter finishing with a dispute in the Socratic method; and soon after I procured Xenophon's *Memorable things of Socrates*, wherein there are many examples of the same method. I was charmed by it, adopted it, dropt my abrupt contradiction and positive augmuentation, and put on the humble inquirer. I continued this method a few years, but gradually left it, retaining only the habit of expressing myself in terms of modest diffidence; never using when I advanced any thing that might possibly be disputed, the words *certainly—undoubtedly*, or any other that gave the air of positiveness to an opinion; but rather say, I *conceive* or *apprehend* a thing to be so or so; it *appears to me*, or I should not think it so, for such and such reasons; or, I *imagine it to be so*; or, *it is so, if I am not mistaken*. This habit I believe has been of great advantage to me, when I have had occasion to inculcate my opinions, and persuade men into measures that I have been from time to time engaged in promoting; and as the chief ends of conversation are to *inform* or to *be informed*, to *please* or *persuade*, I wish well meaning and sensible men would not lessen their power of doing good by a positive assuming manner that seldom fails to disgust, tends to create opposition, and to defeat most of those purposes for which speech was given to us.

"In fact if you wish to instruct others, a positive and dogmatical manner in advancing your sentiments may occasion opposition and prevent a candid attention. If you desire improvement from others, you should not at the same time express yourself fixed in your present opinions; modest and sensible men, who do not love disputation, will leave you undisturbed in the possession of your errors. In adopting such a manner, you can seldom expect to please your hearers, or obtain the concurrence you desire. Pope judiciously observes,

"Men must be taught as if you taught them not,
And things unknown as things forgot."

He also recommends it to us,

"To speak, though sure, with seeming diffidence,"

and he might have joined with this line, that which he has coupled with another.

"For want of modesty is want of sense."—P. 16, 17, 18.

When about 28 years old, after he was married and settled in business, Franklin began to study the languages, and soon acquired a tolerable knowledge of the French, Spanish, Italian, Latin, &c. An acquaintance who was learning Italian with him, used often to tempt him to play chess. Finding this took up too much of the time he had to spare for study, Franklin at length refused to play any more, unless on this condition, that the victor in every game should have the right to impose a task, either of parts of the grammar to be got by heart, or in translations, which tasks the vanquished was to perform, upon honor, before the next meeting. "As we played pretty equally," says Franklin, "we thus beat one another into that language."

We learn from this portion of the early history of Benj. Franklin.—

1. That useful knowledge can be acquired by one's unassisted, but persevering exertions. And,

2. That where the inclination to obtain knowledge exists, ample opportunities present, even to these who are in the daily habits of labor.

THE CULTIVATOR—OCT. 1834.

TO IMPROVE THE SOIL AND THE MIND.

WHEAT AND CLOVER.

The practice has obtained, in Monroe, Orleans, and some of the neighboring counties, the great wheat district of our state, and is rapidly gaining ground, of alternating wheat and clover, that is of sowing wheat and clover seeds every other year upon the same ground. This is said to afford not only an increase of crop, but to effect a great saving of labor. The clover is sown with the wheat in autumn, or upon it in the spring. It is mown or pastured the second year, and the lay is then turned over and wheat and clover again sown upon the first furrow. Thus the grounds receive but one ploughing in two years, and the green manure, afforded by the clover, is all preserved for the wheat crop, not being dissipated by cross ploughings. Thus, too, the clover promotes the pulverization of the soil, keeps it light and friable, and pervious to atmospheric influence, by its gradual decay in the soil. We are advised, upon respectable authority, that under this practice there is seldom a diminution of crop, and that in some cases the product has been nearly doubled in a few years.

The wheat country of the west is a deep secondary formation,—the earth taken from the depth of ten and twenty feet, often exhibiting a fertility, when exposed to atmospheric influence, equal to that of the surface soil. It is a deep deposite of vegetable, animal and earthy matter, abounding in the specific food of the wheat crop. Hence it often occurs, particularly in the oak openings, that tillage, by facilitating decomposition, increases fertility, even without the aid of manure. But the question worthy of consideration is, whether the practice of alternating wheat and clover, even upon these fertile formations, can be long continued, without impoverishing the soil? A yoke of oxen may be turned to a stack of hay, and they may continue to thrive; but at length the stack and the food will become exhausted, and without a further supply, the oxen will ultimately become poor and die. The vegetable and animal matter in our western soils is to the wheat what the stack is to the oxen, the food which causes growth, maturity and profit, and constant feeding must exhaust alike both. Although the clover lay affords vegetable food, it by no means makes up for the exhaustion of the wheat crop; and we suspect it benefits more by rendering the soil porous, and thus facilitating the decomposition of the vegetable matter which it contains, than by its own enriching qualities. We have little doubt but this alternation would soon fail on ordinary soils; and we believe it cannot be long persevered in at the west without serious detriment. The banks of the Hudson were once celebrated for their wheat crops; and within our recollection, west Vermont sent as fine wheat to the Troy and Lansingburgh markets, and it was their staple production too, as now comes from the west. *Now*, west Vermont consumes New-York flour, her soil no longer producing good wheat in any quantity. And Oneida, too, is no longer distinguished as a wheat growing country; the specific food of this grain being in a measure exhausted in her soil. We are aware that the preceding cases do not afford exact parallels for the west. They are drawn principally from transition formations, while that of the west is secondary, and is more permanent in its natural fertility. To assume again our comparison, while nature had supplied one with hay *cocks* merely, she has bountifully furnished the other with hay *stacks:* and the result we think will be, that though the latter will hold out longer, they are, nevertheless, imperceptibly diminishing, and must ultimately be exhausted, as the former have been, by injudicious cropping. Sterility is the worst desease that can afflict a farmer; and the adage teaches, that 'an ounce of prevention is worth a pound of cure." It is far better to keep lands in good heart, by a judicious alternation of crops, than to restore them to fertility when they have become exhausted. Upon this view of the subject, our advice to the western farmer would be that as soon as his circumstances are comfortable, he should cease to sow wheat upon the same grounds every other year, lest he should kill the goose that lays his golden eggs.

EXTRACT OF A LETTER TO THE EDITORS.

"I think in the Cultivator you ought to dwell continually on the importance of science to agriculture; I mean of all the applicable science the world has got: and the world is getting more every day, but with very little thanks to America. We want to see the application of geological and chemical science to the different processes in agriculture. If a knowledge and conviction of the essential importance of lime to the growth of wheat could be brought home to the farmers on the Mohawk river, it would be worth to them a million of dollars. In this section of the state (the west,) God has spread lime over our fields, and mingled it with the soil,—hence we are raising thirty and forty bushels of wheat per acre. On the Mohawk river, God has given to the farmers lime in abundance, *but has not spread it*. A knowledge of the process of burning and spreading lime over their fields would enhance the value of their farms fifty per cent."

REMARKS BY THE CONDUCTORS.

We commend the zeal which our correspondent evinces for the diffusion of agricultural science, and agree with him as to its value in practical husbandry. We are promulgating its principles in the Cultivator as far as we think the public taste will warrant us. But

we ask gentlemen of scientific knowledge to aid us in applying geological and chemical science to the laborers of the field; and we particularly urge an esteemed correspondent to redeem his promise in this particular. We urge him to do it for the public benefit. All have a *public* duty to perform; and much is expected from him to whom much is given.

We are not certain that lime is the *only* requisite in the valley of the Mohawk, to restore the soil to its former fitness for the wheat crop; yet it may be, and the experiment deserves trial. The valley of the Mohawk, and west Vermont, were, within the recollection of the writer, the districts which furnished nearly all the wheat which was bought in Albany, Troy and Lansingburgh. The former now sends to market but a trifling amount, and the latter does not grow enough, nor half enough, for its own consumption. We have little doubt but these districts might again become wheat districts, by the aid of agricultural science, and the value of their products greatly enhanced. But the present generation will neither acqirue nor apply that science. This must, as in every other business, be learnt in youth, and be incorporated with practical instruction. We must look to the rising generation for these improvements, and we must qualify our sons, by timely education, to make these improvements. What, that is useful in this business of life, does the young farmer learn in school, if we even embrace schools of the higher order? The professional man learns in his school many of the fundamental maxims of science, and rules of practice, which are to govern him in his profession. Yet the agriculturist, whose business embraces a far greater scope of science than any one profession, and the profits of whose labors depend essentially upon the application of this science, learns nothing in his school which can forward him in the great business upon which not only his individual success depends, but which constitutes the main source of the public prosperity. The studies of common schools, with competent teachers, might be rendered highly useful to agriculture, by imbuing the minds of the young farmers with the elementary principles of the business which is to occupy him through life.

Seed Corn.—Thomas Foster, of Auburn, writes us, that he has for years selected his seed corn, at harvest time, from stalks producing two ears, preferring the upper ear, and that he has had one-eighth more product than from seed saved in the ordinary way.

"A Subscriber," who dates from Stamfordville, suggests a suspicion, that *Junket* may be unhealthy, because, when left standing, it formed itself into a hard curd. We can only say, that his suspicions are unfounded, as we have used it ten or a dozen years without the least perceptible injurious effect, even on the most delicate habits. Eggs form one of the hardest cements, and yet they constitute a harmless and nutritious food. The laws of chemistry do not apply to the human stomach. The expected effect of rennet upon milk is to produce curd.

Skinless Oats.—The communication of Mr. Thorp, in relation to this valuable species of grain, cannot fail to interest the farmer; and Mr. Thorp deserves their thanks for the care with which he has nursed, increased and brought it into notice. A bushel of these oats, we are told, will weigh forty-five pounds, while the average weight of the common oat is believed not to be over thirty-six or thirty-eight pounds. Mr. T. will exhibit a sample of the skinless oat at the Albany Cattle Fair, on the 8th and 9th October instant.

Ribbon Grass (*Phalaris Americana.*)—We again invite the reader's attention to this subject, and refer him to the interesting letters of Mr. Goodrich and Dr. Harris, under the head of correspondence. The experiments of the latter gentleman seem conclusively to show, that the highest expectations which we indulged in our former remarks, seem likely to be fully realized; and that we have in the ribbon grass a plant peculiarly calculated to render productive and profitable, a description of land hitherto mere waste. There is reason to believe that this grass will prove highly beneficial also upon the sloping banks of streams and rivulets, to prevent their abrasion by the water.

THE PROFITS OF THE DAIRY COMPARED WITH THAT OF FATTENING ANIMALS.

"It has been asserted on the authority of the Board of Agriculture, and upon incontrovertible data, which any farmer or cow feeder may ascertain for his own satisfaction, that the quantity of herbage that will add 112 pounds to the weight of an ox, will, when bestowed on a dairy cow, of ordinary good breed, and in fair condition to yield milk, enable her to yield about 2,700 imperial pints of milk. And as it is well known that even in Scotland, where milk often contains as much cream as that of cows fed on richer pasture, yet in general seventeen pints of milk will yield an imperial pound of butter; and the buttermilk will sell at 1d. the three pints; and as 120 pints of that milk yield from sixteen pounds avoirdupois, of full milk or Dunlop cheese, it is easy to ascertain whether the 112 pounds of beef, or these quantities of butter and buttermilk, or of cheese, will realize the greatest sum.

2,700 pints of milk will yield nearly 385 pounds, or twenty-seven stone imperial of full milk cheese; and if made into butter, they will give 157 pounds, besides the buttermilk, which would amount to half the quantity of milk churned. The average price of beef, for seven years past, has not exceeded 6s. per English stone; and the 112 pounds of course amounts to £2 8s. while twenty-seven stones of cheese, at 5s. per stone, the average price paid by the merchant to the farmer, during the last seven years, amounts to £6 17s. 6d.; and the average price of 157 pounds butter, at 8d. per pound for the same period, amounts to £5 5s. and the buttermilk to £1 17s. 6d. more, or £7 2s. 6d.; so that the average price of the cheese exceeds that of the beef, to the amount of £4 9s. 6d.; and the butter and buttermilk give £4 14s. 6d. more than the beef produced from the same quantity of food to the cattle."

The above extract is from the Quarterly Journal of Agriculture for March. Let us apply its leading facts to our market. We will assume that the average price of beef in our large towns is $5 per cwt. of butter sixteen cents per pound, and of full milk cheese seven cents.

The result would be this:

112 lbs. of beef, at 5 cents,	$5 60
380 lbs. of cheese, at 7 cents,	26 60
157 lbs. of butter, at 16 cents,	24 22

These facts, at all events, are worthy the consideration of cattle farmers.

THE GRAIN WORM AND WEEVIL.

The injury that has been done in a section of our state the present season to the wheat crop by the ravages of an insect, called by some the grain worm, and by others the weevil, ought to lead to the inquiry whether these destructive animals are identical, and if not, what is their true character. Their ravages for the present year have been confined to a small district of country as far as our knowledge extends, but as it is in the nature of these insects to spread, the probability is that in a few years we shall hear of the depretions they have committed through much more extended districts. It is only by acquiring a thorough knowledge of the animal, and its habits, that we will ultimately be able to stop its progress, and thus put an end to the evil. The first question is, are the grain worm and weevil identical? The grain worm is thus described by M. Bauer: "Its first state is an egg, or fungus, deposited in the grain of wheat, whether when growing or not does not appear. Its second state is after the grain has germinated and is growing, when the principle of the fungus is absorbed through the circulatory powers of the plant, and will produce a diseased grain the succeeding season." But it does not appear from him that the growing, or forming ear of wheat, if stung by an insect, will produce the worm soon enough to make its ravages by the time the grain is hardened. His words are, that "it requires several generations of these worms to introduce their eggs into the young germen: the large worms found in the substance of the young stem were undoubtedly some of the worms with which the seed corn or grain was inoculated, for they were on the point of laying their eggs in that stage, and these eggs being again propelled by the rising of the sap a stage further, there come to maturity, and then lay their eggs, and thus progressively reach the elementary substance of the ear, when they are finally deposited in the then forming grain: the whole progress (to reach the grain) probably requires three reproductions." It appears from this account of the grain worm, which to understand more fully we must refer the reader to the April and the August numbers of the Cultivator, that in no case has it been traced to the insect form, and we are left therefore to infer that it does not assume the shape of a fly or beetle, with the power to pierce a grain of wheat, deposite its egg, and thus produce a maggot or worm in the ear. It is upon the principle, therefore, that the egg or fungus of the grain worm, adhering

to or inserted into the kernel of grain, may have its principle of vitality destroyed by coming into contact with lime, and for this reason he recommends that the grain that is to be sown should be immersed in lime water, or have lime sprinkled upon it, to make the worm innocuous. The remedy is easy, and if effectual, it is the fault of every farmer when he becomes acquainted with the antidote, if the grain worm above described by Mr. Bauer is identical with the one which is committing its ravages here, if the evil is not immediately arrested. The application of lime to seed wheat is, under any circumstances, advisable; for, apart from its powers to destroy the vitality of such animalculæ as might adhere to the grain to its injury, it produces a stimulating and quickening effect, which will cause a more active growth of the plant. But will lime water be sufficiently caustic to answer the purpose of Mr. Bauer? It is well known that water will take up only a certain and small portion of lime, and no matter how large the quantity used, the strength of the lime water is not increased. That the quantity of lime so dissolved is small, we must know, from the fact that it may be taken into the human stomach with very little farther dilution. The remedy of lime water diluted with an equal quantity of milk, for certain states of disordered stomach, is too well and has been too long known to require further remark, and if causticity is required in treating of the present subject, we would have it in a much greater degree by adopting the English method for the prevention of smut in wheat—that is, to soak the wheat intended to be sown in urine or brine for a day—at night remove the grain to the barn floor, take as much unslaked lime as would be required, slake it, and as soon as done sift it or throw as much upon it with a shovel, while the heat is passing off, as will adhere to the wet wheat, stirring the wheat well at the same time. This wheat so mixed is to remain one night and be sown the next day. The slaking lime cannot be so hot but when mixed with cold wheat that it will prevent it from germinating. We would therefore advise it to be thrown on as soon after slaking as possible, because no injury can arise from it. To what point the principle of heating wheat without destroying its vitality can be carried, we will soon see, as we now come to speak of the weevil.

The weevil in natural history is thus described: "It is a small insect which does great damage in magazines of corn, by eating into the several grains and destroying their whole substance. This creature is somewhat bigger than a large louse, and is of the scarab or beetle kind, having two pretty, jointed, tufted horns, and a trunk or piercer projecting from the fore part of its head: at the end of this trunk, which is very long in proportion to its body, there is a sort of forceps or sharp teeth with which it gnaws its way into the heart of the grain, either to seek its food or to deposite its eggs there. By keeping these creatures alive in glass tubes with a few grains of wheat, their manner of reproduction has been discovered. The female perforates a grain of wheat, and in it deposites a single egg, or at the utmost two eggs, and this she does to five or six grains every day, for several days together. These eggs, which are not larger than a grain of sand, in about a week produce an odd sort of white maggot, which wriggles its body very much about, but is very little able to move from place to place: this, in about a fortnight, turns to an aurelia, from which is produced the perfect weevil. This destructive creature is itself very subject to be destroyed, and when in the egg or aurelia state, it is eaten by mites." This insect is extremely common in England, and its ravages, not only there, but over a large portion of Europe and many of our southern states, have been almost incredible. It is said the larvæ inhabit the ploughed lands and feed on the roots of corn. The complete insect makes its appearance in the beginning of summer, but its appropriate place is in magazines of corn. Still they have been known in such quantities as to strip trees of their foliage, and to produce mischiefs approaching to the devastation occasioned by the locust tribe. The larvæ, according to well informed naturalists, is two, and sometimes three years in passing from its first state into that of the perfect insect. The eggs are laid in small detached heaps, beneath the surface of some clod: and the young, when first hatched, are scarcely more than the eighth of an inch in length, gradually advancing in their growth, and occasionally shifting their skins, till they arrive at the size of two inches or more. At this period they begin to prepare for their change in a chrysalis or pupa, selecting for the purpose some small clod of earth, in which they form an oval cavity, and, after a certain space, divest themselves of their last skin, and appear in the chrysalis form, in which they continue till the succeeding summer, when the beetle emerges from its retirement and commits its depredations on the leaves of trees and other things that it selects for its food, breeds, and deposites its eggs in a favorable situation; after which, its life is of short duration.

It is evident from the description of the grain worm given by Bauer, and of the weevil, as taken from the best authorities, that although they may be allied or belong to the same order, they are not of the same genus, as they are dissimilar in many points. How far the worm or insect which has committed its ravages here may belong to either or to other orders, farther observation must determine: still, Bauer's description of the worm he has noticed comes much nearer than any other account we have yet seen of this destructive animal.

As a remedy to stop the injury of weevil in a magazine of corn, it is discovered that the most effectual is steaming, and there are some interesting particulars of the process and its effects related in some English reports upon agriculture. It not only stops the progress of the weevil, but so effectually destroys it in all its states, that the grain which has been submitted to this process is used for sowing, and is considered quite clean, as without a new application of the germ of weevil in the ensuing crop it will not again make its appearance. Steaming, they say, does not injure the germination of wheat. Repeated experiments to that effect have been made, and always with the same result. It follows, therefore, that the heat engendered in slaking lime cannot be made so great, under the circumstances in which it is applied to wheat, that is preparing with it to be sown, that its vital principle can in any event be impaired. Hot lime might prove as efficient a remedy for weevil as for the grain worm described by Mr. Bauer. A.

EXPENSE OF CURING HAY.

An accurate account of expense in different operations of farming, has heretofore been so little attended to, that in making out an estimate of costs of any one process of the many that are to be performed, the farmer has to be governed more by conjecture than by any rule of correct calculation. This deficiency is owing to his own neglect, and if he now suffers, as he must necessarily, from the evil, a little time and pains are all that are required to enable him hereafter to count the cost of any one process he may wish to have performed. It is as important to the farmer to know what ought to be the reasonable cost to have a piece of work done, as it is for the manufacturer to calculate the expense per pound or per yard of carding, spinning or weaving, and as we are well assured, that if the last is unacquainted with the expense of each of these processes, he is totally incompetent to carry on his business successfully. It is the same with the mechanic, and that one only, at this day, becomes wealthy, who is competent to make a correct account of profit and loss. Where a farmer does all his own work, it may not be so necessary to keep a debtor or creditor account, but when job work is to be done, as it must in a variety of cases, accuracy of cost is essential to the interest of all engaged. We do not hesitate to say, that a man who would keep a correct account of all the expenses and labor upon a farm, giving a separate page to each laborer, each lot, each horse, ox and cow, with the profits derived from each, and this system kept up for successive years, and extended throughout his whole arrangement, and published, would aid more directly the class of community to which he belonged, and it would give rise to more beneficial results, than the present opening of new canals, or originating other great improvements. We would then be furnished with a guide or table, from which we could calculate the expense of each operation and class of husbandry, and settle the many principles which are now left to reason, and, in many cases, to conjecture. It has been for many years, and is yet, a disputed point among the most intelligent farmers, whether the raising of grain or stock, where there are proportionate facilities for each, is most conducive to their interest, and we do not see that the controversy can be settled in any way, except by keeping the debtor and creditor account we have mentioned. It is useless to enlarge upon the subject. Doubt and uncertainty will always rest upon it, and we suffer from a continuance of the evil, until we adopt a better and more systematic manner of calculating all our expenses and profits. Our object at this time is, to give the expense of curing hay, and it is as accurate as circumstances would allow. It would be better could we estimate the cost per ton, but as a farmer has not the conveniences, and does not weigh the hay intended for his own consumption, it would be difficult to say, with certainty, what is the cost of curing by weight. It is a common observation, however, that twen-

ty feet square and one foot high of well packed hay, give one ton of 2,240 pounds by weight; how far it is correct, we have never had the opportunity of ascertaining. We have estimated it by the load, and a two horse load, with the wagon, or one with an ox cart, are considered equal—each load we put down as twelve cwt. of well cured hay, such it would turn out from the mow.

For cutting, curing and housing	126	cart loads hay,.....			$143	00
do. do	do.	124	wagon	do.	136	00
do. do.	do.	38	cart	do.	34	37
Total,.....		288	loads costing,.....		$313	37

Or $1.08¾ per load.

We give three different statements as the work was done on three different farms, and the first two under the direction of the persons living upon them who were hired tenants, and who employed men to work with and under them—the work was charged at $1 per day wages and board, which was the actual price. How far the tenants who had no interest in the hay, or were not charged with any part of the payment of the expenses, might, if they had been concerned in either or both, by greater efficiency, been enabled to lessen the expense, we are unable to say: they were, however, as competent as the better kind of day laborers, and as the farms were some distance apart, and there was no communication between the tenants, still the expense for the labor done on each is nearly the same. A revolving horse hay rake was used in both instances, and there was no charge for the use of the team to house the hay. Still we have no doubt that had the owner personally superintended the work, the cost would have been less; because his direct interest in lessening all expenses would have created facilities which did not occur to those less interested. In the last statement given this was the case, for there we see thirty-eight loads cured for $34, or about ninety cents per load; whereas the other two cost about $1.12 per load. We have heretofore made estimates of the expense of curing hay, and have uniformly made them at about $1 per load. Last year, the expense was rather less than this; for although the weather was not quite so dry for harvesting, yet as the heat was not so intense, laborers were enabled, on the whole, to do more, and this year, a mower had to go over more ground to obtain the same quantity of hay. A.

CORRESPONDENCE.

SKINLESS OATS.

Albany, Sept. 11, 1834.

Sir,—In compliance with your request, I now give you some account of a new kind of oat, called the skinless oat; of which I received a small parcel (about a table spoonful) in the spring of 1832, said to have come from Siberia, in the north of Asia.

Owing to the very small quantity which I received, and being much pleased with their appearance, I, with great care sowed them in drills in the garden. Their growth is very similar to the common oat, and of the same appearance at maturity, except the head is more compact and larger. The second year I sowed in the same manner, the product of which was about three bushels; and this season I sowed them broadcast upon ordinary ground. They matured some few days earlier than the common oat, which were sown on the same day on the adjoining ground, each kind having the same attention, in all respects, as to quantity of ground, cultivation, &c. &c.

I have not yet threshed them. Their appearance on the ground was extremely fine; the usual quantity of straw, uncommon large and heavy heads, and the products, as to measure, certainly equal if not more than the common oat, and one third more in weight.

They are well adapted to our soil and climate, and require only the same cultivation as the ordinary kind. Half the quantity of seed, however, only, is required per acre.

When threshed, the grain is entirely free from every particle of husk, and has precisely the appearance of the common oat hulled.

A sample of them may be seen at Mr. Thorburn's Seed Store, North Market-street.

I intend to thresh them soon, when I will endeavor to give some further account of them.

For a more particular description of these oats, I have thought proper to annex an extract from the New-York Farmer, vol. 7, No. 1, page 26, which please publish.

Respectfully, your obedient servant,

To J. Buel, Esq. A. THORP.

Extract.—At a meeting of the Warwickshire Agricultural Society, a specimen of the skinless oat was produced by the Rev. Mr. Knott, which had been plucked that morning out of a piece of ground belonging to that gentlemen at Wormlington. It was produced from seed furnished to him from Mr. Tucker of Heanton Punchardon, near Barnstable, Devonshire.

According to the account furnished to us by that gentleman, it was grown in the season of 1830 for the first time. It was produced in Great Britain, by Thomas Derenzy, Esq. of Clebemore Hall, who obtained the seed through a friend of his at Rotterdam, whither it was imported from Shantez, a remote district in China, and was quite unknown to Europeans till within three years.

The advantages which this extraordinary and valuable grain possesses over all other kinds of oats, are numerous, viz: When threshed from the sheaf it is exactly like oat-meal, and it is fit for immediate use for culinary purposes, and every other sort which oat-meal is consumed for, the grain being quite free from every particle of rind or husk. The flavor is delicious, and it contains much more farinaceous matter. There is, of course, considerable saving of oats, and expense of kiln-drying, sifting, &c, &c. and one peck of it contains more nutritious food for a horse than three pecks of common oats.

The produce is astonishing, the average being twenty-six bbls. of fourteen stone to the Irish acre, the exact quantity grown by Mr Derenzy on one acre. It was not sown till the 4th May, 1830, and was reaped early in August the same year.

It is remarkably hardy, and well adapted to the climate.

WILD CARROTS.

Similarly pernicious with the Canada thistle, in being useless and a nuisance, in being rejected by cattle as fit herbage for pasture, in being difficult to be exterminated, and in rapidly spreading over and densely covering fields, door yards, road sides, &c. to the exclusion of grasses more sightly and useful; yet, either through inattention to their progress, or ignorance of their noxiousness, many farmers in this country, perhaps from negligence detrimental both to themselves and their neighbors, permit wild carrots to extend and overrun their grounds, without an effort to subdue them. Seeds may be conveyed from one place to another by winds, birds, &c. it is admitted, but it may be proper for your readers further to know another mode of conveyance: that it is but a few years since any wild carrots (in patches so as to be noticed) were know to be on this Island, and that now they are to be seen in different parts of it; that they have been found to spring up where none previously existed in the neighborhood, in fields recently sowed with red clover seed purchased in the city of New-York; that, as much of the wild carrot is ripe at the same time that the second crop of red clover is cut for seed, it is thought by many that the two are carelessly gathered together, sold and dispersed over the country. From the state of Pennsylvania and the state of New-Jersey, where, in places, the weed is much too prevalent, is brought for sale the greater part of the red clover seed sold in the city of New-York, whence much of it is shipped, the supplies generally for the neighboring country, and the whole annual supply of this county are obtained.

With leaving it to your readers in their own way to condemn and guard against such as would thus "sow tares among wheat," or propagate poison disguised in salutary medicine, it is recommended, as the most simple and natural process found to be successful, to those who find wild carrots growing on their premises, to have them annually, when the seeds ripen, pulled up by the roots, which can easily and speedily be done when the ground is wet and soft by rain. When in blossom they are more readily seen, and their stalks are sufficiently strong to bear pulling without breaking off at the root. Any person so disposed or determined to free his land of their incumbrance may succeed, with a few hours occasional labor in three or four summers, by strictly adhering to a resolve to extirpate them in blossom, or suffer none to mature their seeds. Ploughing, hoeing, mowing, pasturing, &c. in the usual cultivation and rotation of crops, do not destroy them.

The subscriber conforms to the repeated requests of the conductors of the Cultivator, not to sign fictitions names to communications. JOHN J. CROCHERON.

Richmond county, N. Y. Sept. 9th 1834.

ON LAYING DOWN PERMANENT PASTURES.

It would be gratifying if some farmer, or other person of experience and observation, would give some information, through the me-

dium of this paper, relating to the seeding of lands designed for permanent pasturage and meadow. I think it cannot be denied that an error exists with the generality of our farmers regarding this part of husbandry, as it is but seldom that only two species of grass seed, viz: Herd's grass and clover, are applied to all the different and various soils of our country, whether it be sand or clay, loam or gravel; whether the soil be wet or dry, whether it be upland or low-land, rich or poor; whether it be designed for durable pasturage or mowing, or soon to be ploughed and tilled for grain, these, in nine cases out of ten, are the only species of grass which the farmer attempts to cultivate. In this state, and the New-England states, are many farms, and indeed many towns, the soils of which will not admit of the cultivation of grain. The raising of stock, the wool-growing and the dairy business, are here resorted to as being the most advantageous branch of husbandry—hence, it is of the utmost consequence that some more durable species of grass should be incorporated with the soils, than those above mentioned, which require to be renewed every two or three years, and which subject the farmer to a great disarrangement and loss, especially when the soil is not adapted to grain; it is therefore earnestly hoped that some information on this subject will be given.

A FARMER.

RIBBON GRASS.

Hartford, Conn. Sept. 12, 1834.

Sir—I recollect, with pleasure, the interview I had with you in July, and, on my return home, addressed a line to Dr. A. Harris, of Canterbury, Windham county, in this state, relative to the Phalaris Americana. The first information I had concerning it, was from him, which induced me to visit Plainfield, a town adjoining Canterbury, for the purpose of personal examination. Doctor Harris is a distinguished physician and a gentleman of great worth. He devotes much of his leisure to botany and to practical scientific agriculture. I have lately received from him a statement, which I have the pleasure to enclose, and from which you can, if in your opinion the subject demands it, prepare an article for publication.

I am, with sentiments of esteem and respect,
Your humble servant,

J. Buel, Esq. ELIZUR GOODRICH, Jr.

Plainfield, Windham county, Conn.

Dear Sir—I received a letter from you, a short time since, requesting information concerning the ribbon grass, (Phalaris Americana.) The grass you saw at Plainfield, on Mr. Woodward's farm, two years since, I was informed, originated from the ribbon grass. It was originally cultivated in the garden for ornament, where it spread, to the great annoyance of the vegetables. Mr. W. becoming dissatisfied with it, dug it up and threw it over the wall into the mowing lot, where it continued to grow luxuriantly. Being determined to get rid of it, he again took it up and threw it into the brook. It was so tenacious of life, that it seized upon the watery element and spread rapidly down the brook, so that in a few years it extended down the brook more than a mile; its progress towards dry land was more slow, but has eventually spread over a number of acres, converting a bog meadow into the best of mowing. Mr. Bowen, who lived on the farm, informed me that he mowed it twice in the season, and that it produced about three tons to the acre, annually, of excellent hay, which the cattle consumed with as much avidity as any that was cut on the farm.

The meadow was so miry in many places, that cattle could not pass, but the grass roots formed such an impenetrable surface, that they could cart over it in getting hay, without difficulty; and, in some places, they entirely united across the brook, forming a natural bridge that a person might pass over. The brook is sufficiently large to operate a cotton factory which has been erected about a mile below.

I have taken considerable pains to ascertain the history, character and importance of the ribbon grass, and come to the conclusion that it was originally an aquatic grass, and that the striped color was produced by being transplanted into a dry, gravelly soil. I have seen it in a number of places where it had been cultivated for ornament, spreading beyond its boundary and outrooting other grass; in these instances, if in the shade or on moist ground, it loses its striped colour. In one instance, the roots passed under the garden wall into the back yard, and entirely eradicated the other grass, and occupied a number of rods of ground, when it grew rank and lost its striped colour. I have not been able to ascertain the best mode of propagation; it produces little if any seed that will vegetate. The striped grass of the garden. I am confident, does not produce any; for we have cultivated it for near twenty years, and have never known a single spear that was produced from seed. The Phalaris that grows in wet land, blossoms abundantly, but produces very little seed, and that is liable to become fungus, resembling the spurred rye. The propagation by transplanting the roots into wet land, among the bogs, although attended with but little labor, must take considerable time to entirely eradicate the bog grass, as I have proved by experiment. I transplanted, a number of years since, into a bog meadow, some of the grass, and although it took root and grew rapidly, spreading among the other grass, and even sending up shoots in the centre of bogs, still the bog grass remains. I planted, as an experiment, about one-half of an acre of bog meadow with the Phalaris a year last spring, it having been previously ploughed for two or three years; it was planted four feet apart each way; it all lived, and is spreading well, and probably in a few years, will occupy the whole ground. I have ploughed up one acre more, and intend to plant it in the same way. I also sowed some of the seed last spring, procured from grass that grew on wet land, but am not certain that any of it has come up. Shall sow more next spring, and hope in a few years to be able to ascertain its importance, and the best mode of cultivation. Yours, with respect.

ANDREW HARRIS.

Hon. Elizur Goodrich, Jr.

Mr. Cultivator—From the character of your paper, so far as I can judge of it from the seven printed numbers, I think it highly deserving of being introduced into our common schools, as a class book for the elder boys, at least one or two days in a week. Most of the boys in our country schools are to be the farmers, and politicians too, of the coming generation; and all of them expect, at one time or another, to manage a farm or a garden. Early impressions have an abiding influence on the mind; and what impressions so useful as those which have a bearing upon their future usefulness—as those in a business in which they intend to get their living?—The matter in the Cultivator comes home to their employment, their understanding, their interests; it is calculated to make them think, and compare good with bad farming, to nurture good habits, and to excite in them a laudable ambition to become distinguished in their business of life. The paper will have a tendency to lay a substantial foundation, and to beget in our boys a desire and a resolution, to rear themselves, upon this foundation, a noble superstructure of usefulness. Judging from my own feeling, and from the benefits I have derived from the practice of other farmers, through agricultural publications, I think the public advantages of the arrangement I suggest would be infinitely great. The information which I have acquired in this way, even in ten years of manhood, has been of great advantage in my affairs; and I am conscious that the *book knowledge* which I now have, had I possessed it when I started in business, would have been of more value to me than $500 capital: so true is it, that knowledge is power and capital. Cold, calculating cupidity may inquire, how am I to be benefitted? I answer, in the general prosperity. The prosperity and happiness of every good man is intimately identified with the prosperity and happiness of those around him. Those are bad passions, depend upon it, which seek gratification in retarding the march of intellect and the improvements of social life—or depend for enjoyment in encroaching on the comfort of others.

Under a strong impression of public utility, I venture to suggest, for the consideration of a future legislature, the propriety of furnishing each common school with half a dozen copies of your paper, at the charge of the common school fund. This will amount to $1.50 for each district: and the cost may be either defrayed from surplus moneys, or deducted from the sum apportioned to each district.—There is not a district in the state which will not be benefitted tenfold by the information thus disseminated, or I am no judge of cause and effect. FELLENBURGH.

Saratoga, Sept. 20, 1834.

INDIAN CORN SOWN FOR FODDER.

The extreme drought, which has the present season oppressed the vegetable world, and rendered abortive many of the early hopes of the husbandman, would seem a fit occasion to introduce to the notice of farmers, a simple and effective remedy for a deficiency of the grass and hay crop at least. It is the *sowing of Indian corn*

any time in the month of June, at the rate of two bushels to the acre.

The writer has adopted this expedient several times when pasturage and mowing promised to fail, and has found the product generally more abundant, as food for sheep and cattle, than the best meadow. Let it be supposed, that from the 1st to 15th or 20th June, one shall have reason to apprehend a scarcity of subsistence. Let him select his poorest pasture or meadow, after being closely fed, and applying manure or not, according to circumstances, plough, sow, harrow and roll the land. If the season be tolerably favorable, the probability is, in less than ninety days there will be *ten tons* of the most nutritious green food on an acre, which may be cut and fed to milch cows, working or fattening cattle, and even to horses and swine, to great advantage, more especially at a time like the present, when pasturage is nearly destroyed.

By allowing it to stand until just before early frost, the full profit is insured, and a mass of the best quality of winter food is realized at a very trifling expense. The manner of cutting and curing, is to use a strong short grain cradle, and to set it up in small stouts, (not bound in sheaves,) binding the stouts with two bands of the same material, and after it is suitably cured, house, as in case of the corn tops.

It is believed by the writer, that this plan of multiplying animal subsistence is of very great importance, and he hopes another year, some will make experiments of it.

A SARATOGA FARMER.

P. S. It will be recollected that a wheat or rye crop may follow the sowed corn, or, if deemed too late, oats, peas or barley may succeed the next spring. The ground is left light and clean.

A DAIRY FARM.

Schohorie, August 22d, 1834.

Sir—The annexed account of "Orange farm" is extracted from a "Complete view of Baltimore," with directory, &c. 1833, by Charles Varle. The mode of making butter by steam, is novel to me, and is the principal cause of my copying it. I give you the whole article, of which, make any use you please.

Your obedient servant,

A WELL WISHER TO THE CULTIVATOR.

J. Buel, Esq.

"Orange farm, the property of Robert Smith, Esq. containing 4 or 500 acres, situated about three miles from the Court-House, on the turnpike to Havre de Grace: It is conducted on the soiling system, viz. no cattle are allowed to graze on the fields, but occasionally; they are kept in stables; the black cattle, which constitute the base of this system, are here about 100. They furnish daily, in summer, near 200 gallons of milk, and are attended by white people, as being more clean and careful than the black. The cream, which is raised by *steam*, produces very sweet butter, which is sent to the Baltimore Centre Market, every day, and the machine in which it is conveyed, is well appropriated for an easy carriage. It sells in summer at 31 cents per pound, and 50 cents in winter. The sour, or rather butter-milk, because it does not partake of acidity as the other milk *which has fermented*, and whose buttery particles have been taken out is as sweet as fresh milk, and it is sold in market and places of deposite, for two cents a quart.

"The mode of feeding the cows is different from the common mode. Their food is hay and vegetable matter, cut in small pieces and steamed—they carry it to the stalls of the cows.

"The goodness of this system consists of losing no manure, and for not having the soil trampled by cattle. For that purpose, a gutter is placed in every stable, and is so situated, that nothing is lost of what is considered of a fertilizing quality, and is conveyed to a reservoir, from which it is pumped out in a pipe placed in a cart, which is sent to the field to be regularly spread, by means of a spiggot arranged for the purpose.

"This farm has been improved by the above means to such a degree, that hemp will grow luxuriantly on it, while before this system was adopted, the soil was as thin as any other in the vicinity of this city. The quantity of hogs fed on the offals, is a great addition to this good mode of farming.

"The nett income of this farm, is from four to five thousand dollars a year.

"The preceding account is to be relied on as correct, it having been copied from my journal of a tour of agriculture through the United States, made a few years ago."

Mr. Editor—Several methods of drying unripe corn for winter use are recommended and may be practised with advantage. Probably the worst of these is the common one of boiling, and afterwards cutting the grain from the cob. The corn is not only deprived of much of its sweetness and flavor by the boiling, but the best, though not the largest part of each kernel, the *corculum*, or as it is called by the farmers, *chit*, is left on the cob. A far better plan is that adopted by the Indians of Lake Michigan, who roast the corn in a sand bath, heated by a fire which they make on a bed of soft sand, into which the ears are plunged. After being roasted in this way, it is removed from the cob and kept in sacks for winter use.

A neater and still better method is, to put the ears of green corn into a *baker*, or oven of any kind, and roast them about as much as you would do for immediate use. The corn is then shelled, each grain being preserved entire, and spread to dry for a few days, either in the open air or a dry room; and may be kept for years. When thoroughly boiled, (for at least 12 hours,) it is as tender and soft as green corn, to which in flavor it is no way inferior, and constitutes a most admirable ingredient in soups, or if eaten by itself is one of the most delicious and wholesome dishes that can possibly be prepared.

A diet consisting exclusively of corn preserved in this way is regarded as a specific in the removal of a predisposition to cancer.

Yours, very respectfully,

EDWIN JAMES.

CURE FOR FOOT ROT IN SHEEP.

The above complaint has been very troublesome in some parts of the country; and for the information of those not acquainted with a remedy, I should like to see it published in the Cultivator. I had my information from a gentleman who had been much troubled with it. The disease is very infectious, and sheep affected with it should be immediately separated from the flock, and their feet scraped clean, and spirits of turpentine poured in. This course should be pursued once in eight or ten days till the cure is effected, which is accomplished, in most cases, by three applications.

DANIEL CURTIS.

Canaan Centre, September 10th, 1834.

Cattle Husbandry.

THE SHORT HORNS.

Known as Durham, Teeswater, Holderness, Improved Short Horns, &c.

(Concluded from page 73.)

CRITERION OF A GOOD YORKSHIRE COW.

"A milch cow, good for the pail as long as she is wanted, and then quickly got into marketable condition, should have a long and rather small head; a large headed cow will seldom fatten or yield much milk. The eye should be bright, yet with a peculiar placidness and quietness of expression; the chaps thin, and the horns small. The neck should not be so thin as that which common opinion may have given to the milch cow. It may be thin towards the head, but it must soon begin to thicken, and especially when it approaches the shoulder. The dulap should be small; the breast, if not so wide as in some that have an unusual disposition to fatten, yet very far from being narrow, and it should project before the legs; the chine, to a certain degree, fleshy, and even inclining to fullness; the girth behind the shoulder should be deeper than it is usually found in the Short Horn; the ribs should spread out wide, so as to give as globular a form as possible to the carcass, and each should project farther than the preceeding one to the very loins, giving, if after all the milch cow must be a little wider below than above, yet as much breadth as can possible be afforded to the more valuable parts. She should be well formed across the hips and on the rump, and with greater length there than the milker generally possesses; or if a little too short, not too heavy. If she stands a little long on the legs, it must not be too long. The thighs somewhat thin, with a slight tendency to crookedness, or being sickle-hammed behind; the tail thick at the upper part, but tapering below; and she should have a mellow hide, and little coarse hair. Common consent has given to her large milk veins; and although the subcutaneous milk vein has nothing to do with the udder, but conveys the blood from the fore part of the chest and sides to the inquinal vein, yet a large milk vein certainly indicates a strongly developed vascular system—one favorable to secretion generally, and to that of the milk among the rest.

"The last essential in a milch cow that we shall mention is the udder, rather inclining to be large in proportion to the size of the animal, but not too large. It must be sufficiently capacious to contain the proper quantity of milk, but not too bulky, lest it should thicken and become loaded with fat. The skin of the udder should be thin, and free from lumps in every part of it. The teats should be of moderate size; at equal distances from each other every way, and of equal size from the udder to nearly the end, when they should run to a kind of point. When they are too large near the udder, they permit the milk to flow down too freely from the bag, and lodge in them; and when they are too broad in the extremity, the orifice is often so large that the cow cannot retain her milk after the bag begins to be full and heavy. The udder should be of nearly equal size before and behind, or, if there is any difference, it should be broader and fuller before than behind.

"The quantity of milk given by some of these cows is very great. It is by no means uncommon for them, in the beginning of summer, to yield 30 quarts a day: there are rare instances of their having given 36 quarts: but the average measure may be estimated at 22 or 24 quarts. It is said that this milk does not yield a proportionate quantity of butter; and that, although these cows may be valuable where the sale of milk is the prime object, they will not answer for the dairy.

"That their milk does not contain the same proportionate quantity of butter as that from the Long Horns, the Scotch cattle, or the Devons, is probably true; but we have reason to believe that the difference has been much exaggerated, and is more than compensated by the additional quantity of milk."

It is said that the milk increases in richness as the cows grow older. It is conceded on all hands that the Short Horns consume more food than any other breed.

The best *milk* breed of cattle are probably those selected by the London milkmen. The number of these is estimated at 12,000.—The market price of a good dairy cow is £20, ($88.) They are, with very few exceptions, the Short Horn breed—the Holderness or Yorkshire cow described above, and almost invariably with a cross of the improved Durham blood. They are selected for their qualities for milk, as well as aptness to fatten; for they are rarely suffered to breed while in the dairyman's possession. When they cease to give a remunerating quantity of milk, they are fattened and sold to the butcher. This is the case when they cease to give four quarts a day. The cows are principally kept constantly housed—their food and water being supplied in the stable, and are turned out to fatten in yards. They are fed principally with brewer's grains, to which cut clover and roots are added, when these can be had at a reasonable price; oil cake is added to fatten. The grains are deposited in pits, lined with brick work set in cement, from ten to twenty feet deep, firmly trodden down, and covered nine inches with a layer of moist earth, to keep out the rain and frost in winter and heat in summer. They are thus preserved for all seasons of the year.—They are sometimes kept in these, two years without being touched. A very accurate experiment was made by the Duke of Bedford, on the fattening quality of linseed, boiled and unboiled, in which the simple unboiled linseed fattened the animals more expeditiously than any cooked preparation of that seed. The average product of the London dairyman's cows is a little over nine quarts a day.

Although we have fulfilled the task we proposed, of describing the Devon and Short Horned cattle of Great Britain, we think it may not be uninteresting, particularly to cattle breeders, to take a brief notice of the *Long Horns* and *Hornless*, or *Polled* breeds, which form a considerable portion of the farm stock there, and from which our native breeds have in a great measure proceeded.

While the *Short Horns* were principally confined to Durham and York; and the *Middle Horns*, including the Devon, Hereford, Sussex, Welch and Scotch breeds, spread over the south, the north and a part of the east; the *Long Horn* cattle attracted the attention of the midland and some of the western districts of Great Britain. The first improvements noticed in this breed were made by Linton and Webster, but the greatest improvement was made by the celebrated Bakewell, of Dishley, in Leicestershire, whose improved cattle were sometimes denominated the Dishley breed, The points which this great breeder aimed at, were, *beauty of form;* next *utility* of form, in distinction from *beauty* of form; 3. quality of flesh; and lastly, *fattening property*. Many years did not pass before his stock was unrivalled for the roundness of its form, the smallness of its bone, and its aptitude to acquire external fat; while they were small consumers of food in proportion to their size; but at the same time their quality as milkers became sensibly diminished. The *grazier* could not too highly value the Dishley long horn; but the *dairyman* and *little farmer*, cling to the old breed as most useful to their purpose. It was his grand maxim, that the bones of an animal intended for food could not be too small, and that the fat being the most valuable part of the carcass, it could consequently not be too abundant.

The *polled* or *hornless breeds* are in repute in particular districts. The Galloway, from which Colling obtained a cross with the large Teeswater, as the basis of his improved Short Horns, is raised in vast herds in some parts of Scotland, and driven in the fall to the northern counties of England, where they are fattened for the London market. They are a hardy and docile race, admirably adapted for the grazier, yielding the finest meat in the British market. The cows are not good milkers; but though the quantity is small, it is rich in quality. A cow that gives 12 to 16 quarts a day, is esteemed a great milker, and that quantity produces more than a pound and a half of butter. The average for the summer is not more than six or eight quarts.

The Galloway cattle are straight and broad in the back, and nearly level from the head to the rump. They are round in the ribs, and also between the shoulders and ribs, and the ribs and the loins.—They are broad in the loins without any large projecting hip bones. In roundness of barrel and fulness of ribs they will compare with any breed, and also in the proportion which the loins bear to the back bone, or protuberances of the ribs. When viewed from above, the whole body appears beautifully rounded like the longitudinal section of a roller. They are long in the quarters and ribs, and deep in the chest, but not broad in the breast, short in leg, and moderately fine in the shank bones. There is no breed so large and muscular above the knee, while there is more room for the deep, broad and capacious chest. He is clean, not fine and slender, but well proportioned in the neck and chaps. The neck of the bull is thick almost to a fault. The head heavy, the eyes not prominent, the ears large, rough and full of long hairs on the inside. Skin mellow, and of a medium thickness, clothed with long, soft and silky hair. The prevailing colour black, but some are brindled brown. A beautiful heifer of the Galloway breed was slaughtered at Smithfield, which weighed 1,920 pounds. Twenty or twenty-five thousand cattle are annually driven to England for feeding. The expense of driving them 400 miles is from £1 to £1 4s. a head. We have the following amusing account of the economy of a Scotch drovier. "A mountaineer will travel from fair to fair, for thirty miles round, with no other food than the oaten cake he carries with him, and what requires neither fire, table, knife, nor other instrument to use. He will lay out the whole, or perhaps treble to all he is worth, in the purchase of 30 or 100 head of cattle, with which, when collected, he sets out for England, a country with the roads, manners and inhabitants of which he is totally unacquainted. In this journey he scarce ever goes into a house, sleeps but little, and then generally in the open air, and lives chiefly upon his favorite oaten bread. If he fail of disposing of his cattle at the fair of Carlisle, he is probably ruined, and has to begin the world, as he terms it, over again. If he succeeds, he returns home only to commence a new wandering, and a new labor, and is ready in about a month perhaps to set out again for England."

The Norfolk cattle are generally of the polled breed. They have supplanted here the middle horns. A warmer climate and richer soil have rendered them superior to the Galloway in size but not in quality.

In Sussex, the polled breed has been manifestly improved, particularly for the dairy. In the height of the season, some of these cows will give as much as eight gallons of milk in a day, and six gallons is not an unusual quantity. Three of them produced 683 pounds of butter, from June to November. A Suffolk cow will make 150 pounds butter, and 75 whey cheese in a season. They are of small size, and consume comparatively little food.

The *Alderney* cattle are of French origin. The cows are diminutive in size, but are remarkable for the richness of their milk, and the great quantity of butter which it produces.

The *Nagore* cattle are a species lately introduced into England from interior India. They are dissimilar in appearance to any hitherto known breed. The figure of the bull in the work before us, has a large lump upon the back, over the fore shoulders, and an enormous dueiap dropping from the neck and the chaps to the lower

point of the brisket. They are considered the highest breed of Indian cattle. They are used in India by the higher order to draw their state carriages, and are much valued for their size, speed and endurance, and sell at very high prices. They will travel 15 or 16 hours in a day, at the rate of six miles an hour. A pair reached England in 1829. Two calves have been bred from them, and a milch cow is now (1833) in calf by the bull.

Science of Agriculture.

LIME

Is applied to a great variety of uses; it is employed in medicine as an anti-acid; mortar is composed of it, when combined with sand; and it serves as a manure, which is the only view in which we now have to regard it. When used for the purpose of agriculture, it is formed by exposing the substances we have mentioned to a certain degree of heat in the furnace, or kiln, of the lime-burner. When this has been continued for a sufficient length of time, their weight becomes considerably diminished, though they retain their former shape and bulk; and either limestone or chalk, when thus reduced, is in most places known by the name either of *lime-shells*, or *shell-lime*, or simply *shells*. In this state it is called *quick-lime:* the materials of which it is thus composed possess hardly any active property, but when burned, it then becomes caustic to the tongue, and effects the speedy decomposition of most vegetable and animal bodies. When applied in this form—either in the way of compost, or spread over the soil by itself—it is so far from affording nutriment to any thing that may be there growing, that, were its effects to be long continued, it would consume it. But if water be thrown upon it, a great degree of heat is in a short time generated; the burnt shells begin to crack and burst asunder, and the mass gradually crumbles down or falls, as it is more commonly said, into a fine powder, which becomes white, of whatever color it may have been before it was calcined. Or when it has been exposed for a short time to the influence of the atmosphere, it is also found to lose this caustic power, and it is thus reconverted into a substance of the same mild nature as that from which it was obtained—in all its properties exactly resembling chalk.

This operation is called *slacking*, or *slaking;* and lime, when deprived of its scorching quality, is termed *slaked-lime*, or, in the language of chemists, *effete*. Instead of watering it in heaps, the practice which generally prevails is to lay the shells upon a fallow, in small hillocks of about a bushel and a half each, either thrown up around the circumference of each heap, or covered up immediately with some fresh soil made very fine, which, when laid on moderately thick, should be clapped close down with the back of the spade, so as to exclude the admission of either air or rain. In this state it may remain for a few days, care being taken during that time to keep every part of the heaps tight and sound, when it will be found that the moisture of the earth will have completely slaked it. Although it may be thought that this covering of the lime is unnecessary, it yet has this use—that without it the rain would form crusts over the heaps, which would not only prevent the moisture from penetrating regularly thro' them, but would also hinder them from being pulverized without considerable difficulty. It will then be fit for use, and when spread over the field, it should be immediately ploughed in with a shallow furrow, and well stirred with the harrow in every direction. Upon an 18 feet ridge these heaps will be the same distance, or six yards asunder, from centre to centre, if about 200 bushels be laid on per acre; and so on when other quantities are applied. Instead of slaking the lime in this manner, it has however been recommended, "to lay it down in a long heap, or mound, on one side of the field on which it is to be applied. Two laborers are then employed to turn the mound, and a third waters it. When the whole has thus been gone over, it is allowed to lie for four or five days, after which it is again turned, and if any part of the lime should be found to be still unslaked, more water is added."

From this it will be perceived, that one chief cause which renders the burning of lime necessary, arises from the extreme difficulty of obtaining the powder without the process of grinding; but by being thus more finely divided, it can also be more evenly diffused over the soil, with which, therefore, it becomes more evenly mixed, and more prompt in its effects upon the land; and when laid upon it in its hot state, it not only occasions the destruction of weeds, but powerfully stimulates the action of manure.

One very strong reason for applying it instantly is, that, if spread immediately after being turned, and while yet in a powdry and caustic state, a smaller quantity may suffice to cover the whole surface of the ground, and to come into contact with more minute particles of the soil; whereas, if suffered to lie for any length of time exposed to the atmosphere, it imbibes so much moisture that it runs into clods, and can never again be so equally divided into small parts, wherefore a much larger quantity is required to produce the same immediate effect. It is in this state, also, that it acts the most powerfully upon all organic matter, which may be already lying undecomposed within the soil—insects, the fibres and roots of obnoxious plants, and the seeds of weeds, which it dissolves and transforms into mould. It is also more efficacious than effete lime in its influence upon what is called *sour land*, though simple chalk, if applied in large quantities, will correct the evil. Neither is it improbable that, during its process of slaking, the heat which it generates by absorption of moisture causes it to swell in a manner which the tenacity of the soil cannot resist: thus producing fermentation, it not only eventually makes the land mellow, but renders matter which was comparatively inert, nutritive, and is probably more beneficial to land containing much woody fibre, or animal fibrous matter, than any calcareous substance in its natural state.* If, therefore, quick-lime really possesses superior qualities as a manure, it seems only fair to infer that, the greater the strength and vigor of such properties, the more assuredly will they effect its purpose when in that state, than after it has been rendered effete.

Considerable judgment is however requisite in this mode of its application; for, although it promotes putrefaction, and converts the pulp, or saponaceous substance, of vegetable matter into the food of plants, yet, if too great a portion of lime be added, it may have a contrary effect; and it always destroys, to a certain extent, the efficacy of animal manures, either by combining with certain of their elements, or by giving to them some new arrangement. It is necessary to the reduction of carrion, or for qualifying the noxious effluvia of night-soil; but is so injurious, when mixed with any common dung, that it tends to render the extractive matter insoluble; thus, if a sufficient quantity of quick-lime be added to a heap of stable-dung in a state of fermentation, it will set it on fire, and the whole will be consumed. It should never, therefore, be mixed with farm-yard manure, unless a small quantity be found absolutely necessary for the prompt destruction of seed-weeds, or the decomposition of roots; but when laid upon the land during the same season, the dung should be ploughed down alone, and the lime afterwards harrowed in with the seed-furrow.

By neutralizing the acids combined with the mould, this manure qualifies the vegetable and other soluble substances also present in it, and occasions the whole to be converted, by the influence of the atmosphere and of water, into nutriment for plants; but in poor soils, having less vegetable matter to convert into mucilage, it acts so powerfully as not only to exhaust such land by its final effects, but to be prejudicial to the immediate crops.† We have, indeed, the opinion of a very experienced farmer, who is also well versed in chemistry, 'that, should much rain immediately succeed the ploughing, and any considerable portion of sand be either in the lime or in the soil, it is almost a moral certainty that such soil will be in a worse state than it was before the lime was put on, because, the moisture being retained by the lime and the soil, and the tenacity of the substratum not suffering the superabundance to pass quickly away, it causes the whole to run together, and form a compact and impervious bottom, which before, however, might have been pervious in a slow degree. That this must be the case is evident from this consideration,—that quick-lime, mixed with a certain portion of sand, and duly moistened, contracts and forms a substance which we call mortar, or cement; in proportion, therefore, as the quality of these

* In its *first effect*, burnt lime decomposes animal matter, and seems to accelerate its progress to a capicity of affording nutriment to vegetables; gradually, however, the lime is neutralized by carbonic acid, and converted into a substance analogous to chalk; but in this case it more perfectly mixes with the other ingredients of the soil, and is more pervadingly diffused, more finely divided, than mere chalk, artificially applied.—*Sir Humphrey Davy, Elem. of Agric. Chem. lect. vii.*

† 'All the experiments yet made render it probable that the food of plants, as it is taken up from the soil, is imbibed by the extremities of the roots only. Hence, as the extremities of the roots contain no visible opening, we may conclude that the food which they imbibe must be in a state of solution at first; and, in fact, the carbonaceous matter in all active manures is in such a state of combination as to be soluble in water whenever a beneficial effect is obtained.' —*Dr. Thomas Thomson's Chemistry, 2d edit. vol. v. p. 376.*

materials is more or less perfect, so does the substance become more or less compact, hard, solid, and impervious; such must be the condition of the soil; and it is but reasonable to suppose that a great part of the seed sown upon it must perish.'

It may indeed be alleged that the caustic action of quick-lime can never be exerted to any great extent, as it attracts fixed air too strongly not to become immediately slaked; but its effects are found to be powerful even in that short period, provided that it be promptly and intimately mixed with the soil, for though the land should contain an abundance of vegetable matter, yet if it has been injudiciously cropped, or insufficiently manured, the lime will only add to its infertility.

When quick-lime has been deprived of its causticity, it is called by chemists, *carbonate of lime*, and in that mild state it does not act upon animal or vegetable matter with the same violence as quick-lime, but instead of dissipating any portion of the substance which may be contained in the soil, it facilitates its reduction into that state by which it the most effectually assists vegetation. Neither has it the same tendency to combine, as it were, into a mortar with the sand of poor clays.

Lime, however, *whether quick or slaked*, when used by itself, without any addition of earth, is not possessed of any vegetative quality: thus, 'seed planted in a flower-pot filled with powdered carbonate of lime, regularly watered, vegetated feebly, made little progress, and died without coming to perfection; but when partly filled with garden-mould, and carbonate of lime one and a half inches thick over it, the plants put down their radicles straight through the lime, without ramifying or stretching sideways, till they arrived at the mould.' Even in a mixture where lime was only one-fifth, the plants were poor and sickly, and made no progress: and when quick, it, with the aid of water, suddenly destroys all vegetable substances. It may even be hurtful to vegetation when laid in too large a quantity upon very light and warm soils, for, by quickening evaporation, it dries the land too much, by which means plants are deprived of the moisture necessary to their sustenance; therefore it is that calcareous earths are frequently known by farmers as 'burning soils;' and, by its injudicious use or repetition, without the aid of animal or vegetable manure to supply the nourishment of which they have been deprived by crops, the growth of which has been thus forced, land, though of superior quality, may at length become exhausted, Thus experience teaches that lime, when applied to land, has different effects upon some soils than it has upon others: on many there is a rapid and permanent improvement, on others there is less benefit, and on some it is said rather to retard than to promote vegetation.

This is no doubt chiefly influenced by various unascertained properties in the soil, and partly also by difference in the qualities of the lime istelf, arising from its mixture with other earths.

Whether it possesses any further properties, through the stimulating effects of light and heat upon the vegetable fibre, has been conjectured, but has not been supported by any positive fact, and seems to be contradicted by the slow effect of effete lime in its operation upon the soil. It is, however, worthy of remark, that calcareous earth is found in the ashes of all vegetables; that it is present in a larger proportion in wheat, clover, and some other plants whose growth is especially promoted by the use of calcareous manures, and many are said not to ripen in ground in which it is entirely wanting. We may, therefore, conclude that it is of the highest importance in the process of vegetation, and that an accurate investigation of its mode of action, by enabling us to judge with more certainty of its powers, would greatly tend to the improvement of agriculture. It is indeed much to be regretted that the subject has not been more fully investigated, and that some more definite judgment has not been framed regarding the properties of lime, the effects of which in its application to the soil are exposed to the most contradictory results. Much money has thus been uselessly expended and labor thrown away, which, under better information, might have been saved; and without scientific analysis of the component parts both of soils and of lime, we remain much in the dark regarding their effects on vegetation; but, judging from the faint lights with which we have been furnished, we shall still endeavor, by comparing science with practice, to obtain such instruction as may guide us to an economical and useful application of this manure to field culture.—*British Husbandry.—To be continued.*

"Fortune is as a glass; when she shines she is broken."—*Pub. Syr.* With its splendor, she also possesses its fragility.

Household Affairs.

To Steam Potatoes.—Put them clean washed, with their skins on, into a steam saucepan, and let the water under them be about half boiling; let them continue to boil rather quickly till they are done *If the water once relaxes from its heat, the goodness of the potato is sure to be affected, and to become soddened be the quality ever so good.* A too precipitate boiling is equally disadvantageous; as the nigher part to the surface of the root begins to crack and open, while the centre part continues unheated and undecomposed.

To Make Potato Bread.—Boil the potatoes not quite so soft as common, then dry them a short time on the fire, peel them while hot, and pound them as fine as possible; next put a small quantity of pearl ash to new yeast; while it is working briskly, add as much rye meal or flour as can be worked in. Mix the whole well together, but do not add any water to it. After the dough is thus prepared, let it stand an hour and a half or two hours before it is put into the oven. Observe it will not require so long baking as regular flour bread.

To Make Tomato Catsup.—Boil tomatoes, full ripe, in their juice, to nearly the consistence of pulp, pass them through a hair sieve and add salt to the taste. Aromatize it sufficiently with cloves, pepper and nutmegs.

To Make Tomato Sauce.—Peel the ripe fruit—if dipped in scalding water the skin readily separates—boil or simmer them in their juice, without water, until the moisture is sufficiently evaporated, and season with salt. A little crumb of bread, or pulverized cracker may be added.

[The tomato may be raised in every garden. They make a pleasant sauce for meats, and habit soon renders them very desirable. They are said to promote health by removing biliary obstructions.]

To Make Rhubarb Pies.—Peal the leaf stalks of the rhubarb, and cut them in half inch pieces, lay them on the crust as you would gooseberries, currants or other fruit; and strew over a plenty of sugar, a little orange peal, and, if you like, some nutmeg, and then cover and bake.

[Several varieties of the rhubarb are used for pies and tarts. They are equal to the gooseberry for this purpose, and resemble this fruit very much in flavor. The rhubarb is a perennial herbaceous plant, with leaves larger than the burdock, is raised with little trouble, and may be used most of the summer. In rich ground a single root will afford materials for a dozen or more pies. The seed ripens in August, and is best sown as soon as it is gathered, though it keeps good till the following year. It may be readily transplanted in fall or spring. I have used a new and superior variety this year, the seed of which came to me in July 1833, enclosed in a horticultural publication from London. It was immediately sown, and last spring transplanted.]

Dutch Pudding.—Cut a round piece out of the bottom of a loaf, and put that and the piece that was cut out into a quart of cold new milk, in the evening, and let it stand all night. If the milk is all soaked up by morning, add some more. Put the piece in the bottom again, tie the loaf up in a cloth, and boil it an hour. Eat with sugar, or with melted butter, white wine and sugar sauce.

Apple Jelly.—Take of apple juice strained 4lbs. sugar 1 lb. Boil to a jelly.

Miscellaneous.

From the Montreal Daily Advertiser.

THE WHEAT-FLY.

Sir,—In a paragraph which appeared in your *Courier* of Friday last, copied from the *Sherbrooke Advocate*, the damage to the kernel of wheat in the ear of the growing crop, has been attributed to the insect called weevil. This surely is a mistake, the weevil is a very different sort of insect from that which has damaged the wheat in this neighborhood.

The Encyclopædia of Agriculture describes the wheat-fly, which has been one of the greaest enemies to the wheat crop in Scotland of late years, and I have every reason to suppose it is the same species of fly that has caused the injury to wheat this summer.

The following article is from the *Encyclopædia*:—In the modern nomenclature, the Rev. W. Kirby informs us that the wheat-fly, ormerly the *Tipula tritici* of Linnæus, is now the *Cecidomyia tritici*: and the Hessian fly the *C. destructor*. The wheat fly generally makes its appearance about the end of June; and according to the

observations of Mr. Sherriff, they exist throughout a period of thirty-nine days. The hue of the fly is orange, the wings transparent, and changing colour according to the light in which they are viewed. It lays its eggs within the glumes of the florets, in clusters varying in number from two to ten, or even to fifteen, and the larvæ feed upon the grain. They are produced from the eggs in the course of eight or ten days; they are at first perfectly transparent, and assume a yellow colour a few days afterwards; they travel not from one floret to another, and forty seven have been numbered in one. Occasionally there are found in the same floret, larvæ and a grain which is generally shrivelled, as if deprived of nourishment, and although the pollen may furnish the larvæ with food in the first instance, they soon crowd round the lower part of the germen, and they, in all probability, subsist on the matter destined to form the grain. The larvæ are preyed on by the *ceraphron destructor*, or *ichneumon* fly, which deposites its eggs in the body of the larvæ of the wheat-fly; and this is the only check hitherto discovered for preventing the total destruction of the wheat crops attacked by the *cecidomyia*. Mr. Sherriff, speaking of the ichneumon, says, 'I could not determine if it actually deposites its eggs in the maggot's body; but there can be no doubt, however, of the ichneumon piercing the maggots with a sting; and from stinging the same maggot repeatedly, it is probable the fly delights to destroy the maggot, as well as deposite eggs in their bodies. The ear-wig, also, destroys the maggots as food.' Mr. Gorrie estimates the loss sustained by the farming interests in the Carse of Gowrie district alone, by the wheat-fly, at £20,000 in 1827; at £30,000 in 1828: and at £36,000 in 1829. The same writer, in May, 1830, thus depicts the prospects of the wheat crop in the Carse of Gowrie: 'The *cecidomyia* are still alive in formidable legions. That the flies will this season be in as great plenty as ever, is quite certain: that they will lay their eggs on no other plants than those of the wheat genus, is also true: the only chance of escape is in the time the pupæ appear in the fly state: should the sunny weather bring them forward within a fortnight or three weeks from this date, the greater part will have perished before the wheat is in the ear, or should the earing take place before the fly appears, the late or spring sown wheat will suffer—but these appear slender chances. We know the history and habits of the insect too well to believe that either mist, or rain, or dew, or drought will either forward or retard their operations, if the main body appear about the time the wheat comes to the ear.'"

From my own observations I am convinced it is the same species of insect described above, that we have got here. I am not aware that it has been known in Canada before last year, and it appears to have multiplied prodigiously. Now that the wheat has got ripe and hard, the maggots have disappeared; it is only when the grain is in the soft and milky state they prey upon it, or rather upon the matter destined to form the grain. Wheat on new lands does not appear to have suffered so much as that on lands long cultivated; this I know by experience. My wheat was on new land this year, and has not been much injured; this circumstance should induce further inquiry, which might, perhaps, lead to the discovery of some remedy for an evil which may otherwise be a very great one here, where wheat is the principal crop that farmers cultivate.

I have the honor to be, sir, your obedient servant,

Cote St. Paul, August 13, 1834. WM. EVANS.

[*From the Quarterly Journal of Agriculture, Mechanics, &c.*]

THE RELATIVE PLEASURES AND PROFITS OF AGRICULTURE.

BY H. W. DELAVAN.

Sir,—I have received your letter of the 15th of March, and regret that neither my experience or ability is adequate to do justice to the various topics you have intimated relating to the subject of agriculture.

Since you have paid me the compliment to consult my opinions, I will endeavor briefly to state them, in a manner which will substantially constitute a reply to your several inquiries.

The pursuit of husbandry has not yet attained to the rank to which it is entitled in the northern portion of the United States—a rank which is conceded to it in some other sections of our country, and among the most enlightened nations of Europe. This circumstance will serve to retard advances in the most useful avocation, which a higher estimate on the part of the enlightened classes of our citizens could not fail to create. Yet it cannot be doubted that this department of life will more and more be sought for, its intrinsic advantages, presenting, as it does, a healthful occupation to mind and body, and a stability which no other pursuit can equal. It migh seem invidious to institute comparisons among the several occupations incident to civilized life. Let it suffice that each has its appropriate usefulness, and that husbandry is not the least useful or least honorable among them. Many illustrious men have borne testimony to the diversified pleasure of rural life, and that it affords occupation to the most enlarged capacity.

In reply to the question, whether "capital may be properly invested in cultivated land," I confidently answer *it can; and I am of the opinion, that in no other way can a moderate fortune be so profitably employed.* In adopting this conclusion I am supposing the objects to be safety, productiveness, comfortable life, pleasant occupation, the education of children, and the transmission of property to descendants.

It may, on a superficial view appear paradoxical, that the cultivation of land can compete in profits with the adventures in commerce, or the operations of machinery. It is the greater uniformity in the products of land contrasted with the ever fluctuating character of commerce and manufactures, which establishes the point in question. If it be true, as is asserted, that in our own country, every twenty years witnesses the *insolvency* of the whole aggregate trading community, what does it not argue in favor of a pursuit in which a man need never fail?

The habits of expense, engendered by commerce, constitute a heavy annual levy upon the income of the prosperous merchant. Those habits are too likely to survive the prosperity which fostered them, than which a more deplorable condition cannot well be imagined.—But he who resides on a landed estate, and practises assiduity, and evinces the intelligence of the merchant, the manufacturer or professional man, may sustain himself during periods of depression without diminution of capital at any rate. His habits are frugal, which is equivalent to wealth; his daily occupation is a lesson of economy, a term seldom addressed and never palatable to American ears; a virtue as far removed from meanness as it is from prodigality, the more general practice of which could not fail to give greater stability to private and public prosperity.

The trading classes usually incur debts beyond the capital possessed by them, and frequently, credit alone is the expedient relied upon. The farmer of even small possession need incur no debts; this difference is vital, and gives to the land proprietor a guarantee of success and certainty which other classes cannot possess. My object in the preceding remarks, is to inculcate the idea, that to those who are in circumstances to elect their mode of life, agricultural pursuits are the most eligible. But in order to succeed in husbandry in the condition of things existing among us, the proprietor must vigilantly conduct his own affairs; he may hire men to labor, but he cannot so readily hire them *to think.* A man with us, who has a small respectable capacity, will become a small proprietor rather than a hireling. Agriculture is *not an amusement,* more than law or commerce are such; and what lawyer or merchant could dream of success while leading a life of idleness or pleasure.

Agriculture is not incompatible with mental cultivation; it is favorable to virtue, as the farmer knows nothing of the strifes and rivalries, which grow out of competition in other pursuits, and which lead men to look with an evil eye upon the prosperity or skill of a neighbor. The country resident escapes many of the time-destroying frivolities of the town, and, on the other hand, has fewer of the social advantages which conduce to refinement. These things may be offset to the freedom and healthfulness of rural existence, where man draws less of his satisfaction from others, and more from himself and the works of God, divested of the conventional rules which constitute an artificial existence.

There is one part of your letter which I deem it important to notice, the most pactical part, and relates to the articles of culture which an agriculturist should select as his own, among the many. * * * * * * *

In determining the objects of culture to which a person attempting farming should select as primary, the circumstances of soil, position, and the price of land, should govern. In western New-York, wheat is the great staple, for the reason that much of the soil of that region is well adapted to its production. The Hudson river counties, on the contrary, seem, by the variety of soil, to be favorable to the dairy, wool-growing, and stock generally, as also to the growth of all the grains produced in a northern latitude.

What is denominated *convertible husbandry,* or rotation of crops

is the improved feature in modern husbandry, as it conduces to the constant improvement of land; and while it diminishes labor it increases products. Neither grazing nor cropping, exclusively, can be deemed judicious, as both, when combined, are admirably calculated to aid each other, the former supplying manures to give a profitable effect to the operations of the plough; and besides, the regular employment given to laborers at all seasons, by uniting the different parts into one system, is an advantage which every economist will appreciate.

In conclusion, I would decidedly discourage amateur farming, as it usually is brief in its history, and disastrous in its results. But to such as seek rational employment where a comparative independence may be enjoyed, I would recommend agriculture.

If I may be allowed to speak of my individual undertakings, I would say that an investment of a large sum in the course of a few years, in lands, improvements, and animals, commenced in inexperience, and misdirected by ignorance, my anticipations of profit have not been disappointed. The nature and magnitude of the trust have tied my attention to its accomplishment, and I have the satisfaction of finding my income yearly increasing, and my expenditures diminishing. I am sir, yours, &c.

Ballston, May 1, 1834. HENRY W. DELAVAN.

On Pickling Seed Grain.—This process is indispensably necessary on every soil; otherwise smut, to a greater or less extent, will, in nine cases out of ten, assuredly follow. Though almost all practical farmers are agreed as to the necessity of pickling, yet they are not so unanimous as to the *modus operandi* of the process, and the article which is best calculated to answer the intended purpose. Stale urine may be considered the safest and surest pickle; and where it can be obtained in sufficient quantity is commonly resorted to. It is either used as a steep, or sprinkled upon the grain. Some again are advocates for a pickle made of salt and water, sufficiently strong to buoy up an egg, in which the grain is to be thoroughly steeped. But whatever difference there may be as to the kind of pickle that ought to be used, and the mode of using it, all agree in the utility of mixing the wetted seed with *hot lime* FRESH SLAKED; and this, in one point of view, is absolutely necessary, so that the seed may be equally distributed. There is some danger from the first of these modes; for if the seed steeped in urine is not immediately sown, it will infallibly lose its vegetative power.—*New Edin. Encyc.*

Young Men's Department.

IMPORTANCE OF SCIENTIFIC KNOWLEDGE TO THE YOUNG FARMER.

The diseases of cattle.—This is an important subject. There is no individual of many years experience in farming, who has not suffered severe losses from the death of horses, cows or sheep. Diseases amongst sheep are perhaps the most common and most extensive, and to whom is the cure of them entrusted? Generally to a laboring man, who has not the remotest knowledge of the several organs which compose the animal frame, or of their functions, and whose education has not fitted him to reason correctly even upon the few facts which he knows. What should we think of entrusting our friends or relations in sickness to a man who had studied no more of anatomy or medicine than a shepherd? And the mischief is not confined to their ignorance of the true remedy. Ignorant men are the most irreclaimable theorists. They attribute disorders to the most fanciful cause, and then, from their assumed and absurd premises, they argue away to a conclusion as hard as a geometrician. I have heard many striking instances of this from a friend of mine, who is himself both a physician and a philosopher. One poor patient laid the blame of his sufferings upon a cause which few would have thought of. "Sir," said he, "*it is the wind meeting the digester;*" and no doubt his remedy would have been to put some covering round the digester to keep the wind away. Another poor fellow was troubled with a "*rising of the lights;*" and being asked whether he had taken any thing for it, "yes," he said, "*he had swallowed some shot to keep them down.*" And I beg to assure the incredulous, that this is an extremely common disease and remedy in this neighborhood; and these are the very men who prescribe for our sheep! Formerly it was common to ascribe diseases to the direct operation of the devil, and of course the cure was co-relevant to the assigned cause. "Touching the heart and liver, if a devil or an evil spirit trouble any, we must make a smoke thereof before a man or a woman, and the party shall be no more vexed, and the devil shall smell it and flee away, and never come again any more." And the story goes on to say, that in Tobet's case the evil spirit fled, when he had smelt it, into the utmost parts of Egypt. But I do not suppose that this kind of fumigation would answer now a days. But *revanons a nos moutons*, or rather let us proceed with the horses, with which, indeed, the case is not much better. If you send for a farrier, the message not unfrequently is, that he cannot come to see the horse to-night, but that he has sent him a drink, and will come and see him in the morning. Now, try this system by the same test:—How would you like it yourself? You are suddenly attacked with a violent complaint, and you send for the physician. He never saw you perhaps in his life, and knows nothing whatever about what is the matter with you; but he sends his compliments and desires you to take a dose of Daffy's elixir; and if your complaint be what is very common with horses, viz. inflammation of some of the viscera, this dose will probably finish you, as out of all doubt it has finished many an unfortunate quadruped. Not that the absence of the farrier signifies much; he probably does not know a bit the less of the disease on that account. The study of horse medicine and surgery has no doubt made much greater progress than that of cows and sheep, and some of its professors are men of sense and education; but how few are they compared to those of an opposite character. It was said with much spirit and truth, by an old physician, that in all cases of illness there were three things to consider—the patient, the disease and the doctor; and that if any two of them pulled well together, they would be able to beat the third. In the case I have been supposing, it is the disease and the doctor against the patient.

"Cows, again, stuff themselves with cabbage, or other succulent food, which by and by ferments, and gives out a great deal of carbonic acid gas; the stomach becomes distended, and if relief be not speedily afforded the animal dies. Many a valuable creature has perished in this way, whose life might have been saved if the owner had been chemist enough to know what would stop the fermentation, or had been provided with mechanical instruments for drawing off the gas. And these attacks are sudden—remedies to be useful must be near. There is no time to fetch the doctor, even supposing him to be worth fetching. The owner himself must know what to do, and how to do it. It is not proposed to make every farmer an accomplished surgeon; that would be impossible; but it is not impossible, and it would not be useless, to teach him at school, [or for him to teach himself afterwards,] something of the structure, and diseases of the animals on whose health his fortune depends; something of the symptoms by which those diseases are indicated, and something of the operation of the most important medicines. Being so constantly slaughtered for domestic purposes, there never would be wanting opportunities for studying their organization. In Holland, above 500,000 cattle are known to have died of disease within twenty years. At £10 a piece, this would come to £250,000 ($1,110,000) a year. The tenth part of one year's loss upon this article of cows alone, would be enough to put into operation throughout the whole kingdom, schools, which would create ten times as much wealth annually as we ever lost by the death of cows. If the money laid out in diffusing knowledge produced a return of only one hundred fold, it would be certainly an eligible investment; but a hundred fold would be little, compared with its eventual products.

"*Mechanics.—The art of producing a given result with the smallest expense of power.*—It is very important to make power go as far as possible, because it is the dead weight upon a farm. Horses eat and drink, but produce neither meat nor wool. Perhaps the best way to show the value of this kind of knowledge, is to point out the losses attendant on its absence. Every body must have seen ploughs so illy constructed as to require three hoases to draw them through a soil which might have been worked well enough with two in a plough of the improved pattern. Instead of a sharp edge, contrived to cut the ground, and a well-formed mould-board to turn it over, you may sometimes see a blunt edge dragged slowly through the soil, to the intolerable fatigue of the cattle, as well as the rapid destruction of the plough and harness; but little work is done, and that little in a slovenly and expensive manner. Carts and wagons too are susceptible of great improvement; their more common faults are their weight—the friction of the axle, the dishing of the wheels, and the want of springs; the consequence is, that a horse is jaded and knocked up by what would, under more skilful management, have been an easy day's journey. An acquaintance with mechanics would also

induce a man to pay more attention to the state of the roads. But besides carts and ploughs, we are every day producing fresh machinery. We thrash, dress, plant and sow by its aid, and though of no very intricate construction, these machines are somewhat more so than the old farming implements. The farmer is not expected to neglect his labor to study their principles, and he is not up to his work unless he can tell whether his tools are well or ill made, and can see the cause of any defect in their workings. If, by a little there and here, a man can save the labor of one horse on a farm, it is a great thing. The multitude of machines which are rising like meteors around us, should, in this branch of science at all events, unteach us the foolish vanity of supposing our present practice to be the best possible. In the West Indies they are no doubt as well convinced of the excellence of their agriculture as we are, and they have not generally introduced either the plough or the wheel-barrow! My authority for this is the writer of a lively sketch of their manners and customs, entitled, "Marley, or a Planter's life in the West Indies." He says, "After a week or five days of this kind of labor, very distressing to the people, few acres indeed were gone over, although there were rather more than 100 negroes employed, one day with another, digging only the holes in the ground. *Had the ground been previously tilled, with the plough*, an amazingly greater quantity of those holes would have been made in one day than it was possible for the people to effect in three or four in the manner in which they worked." "To carry the manure to the required spot was the task of the negresses, and the weak negroes, who, with some little help at the manure heaps, had to fill their baskets and then carry them on their heads, at a pretty smart pace, and empty them in the holes. This employment of bearing the manure none of the carriers relished, but the stimulus of the whip, and the daily encouragement of a glass of rum, effected wonders. *Had the people been furnished with wheel-barrows*, they would have performed their tasks with ease."

"It need not be inferred from this, that I suppose our practice to be as faulty as theirs. It is adduced for no other purpose than to arouse people from the lethargic dream in which we are all too apt to indulge, that the established practice is the *ne plus ultra* of perfection."—*Mr. Hawkins in the Quarterly Journal of Ag.*

LIFE OF FRANKLIN.

We now give, as we promised, some account of the rules which Franklin adopted to regulate his conduct in life; and in doing this, we shall quote his own words.

"It was about this time I conceived the bold and arduous project of arriving at *moral perfection;* I wished to live without committing any fault at any time, and to conquer all that either natural inclination, custom, or company, might lead me into. As I knew, or thought I knew, what was right and wrong, I did not see why I might not *always* do the one and avoid the other. But I soon found I had undertaken a task of more difficulty than I had imagined; while my attention was taken up, and care employed in guarding against one fault, I was often surprised by another; habit took the advantage of inattention; inclination was sometimes too strong for reason. I concluded at length that the mere speculative conviction, that it was our interest to be completely virtuous, was not sufficient to prevent our slipping; and that the contrary habits must be broken, and good ones acquired and established, before we can have any dependance on a steady uniform rectitude of conduct. For this purpose I therefore tried the following method:

In the various enumerations of the *moral virtues* I had met with in my reading, I found the catalogue more or less numerous, as different writers included more or fewer ideas under the same name. *Temperance*, for example, was by some confined to eating and drinking; while by others it was extended to mean the moderating every other pleasure, appetite, inclination, or passion, bodily or mental, even to our avarice and ambition. I proposed to myself, for the sake of clearness, to use rather more names, with fewer ideas annexed to each, than a few names with more ideas; and I included under thirteen names of virtues, all that at that time occurred to me as necessary or desirable; and annexed to each a short precept, which fully expressed the extent I gave to its meaning.

These names of *virtues*, with their precepts, were:

1. TEMPERANCE.—Eat not to dullness; drink not to elevation.
2. SILENCE.—Speak not but what may benefit others or yourself; avoid trifling conversation.
3. ORDER.—Let all your things have their places; let each part of your business have its time.
4. RESOLUTION.—Resolve to perform what you ought; perform without fail what you resolve.
5. FRUGALITY.—Make no expense but to do good to others or yourself; i. e. waste nothing.
6. INDUSTRY.—Lose no time; be always employed in something useful; cut off all unnecessary actions.
7. SINCERITY.—Use no hurtful deceit; think innocently and justly; and, if you speak, speak accordingly.
8. JUSTICE.—Wrong none by doing injuries, or omitting the benefits that are your duty.
9. MODERATION.—Avoid extremes; forbear resenting injuries so much as you think they deserve.
10. CLEANLINESS.—Tolerate no uncleanliness in body, clothes, or habitation.
11. TRANQUILLITY.—Be not disturbed at trifles, nor at accidents common or unavoidable.
12. CHASTITY.—Rarely use venery, but for health or offspring; never to dullness or weakness, or the injury of your own or another's peace or reputation.
13. HUMILITY.—Imitate *Jesus* and *Socrates*.

My intention being to acquire the *habitude* of all these virtues, I judged it would be well not to distract my attention by attempting the whole at once, but to fix it on *one* of them at a time; and when I should be master of that, then to proceed to another; and so on ti l I should have gone through the thirteen; and as the previous acquisition of some, might facilitate the acquisition of certain others, I arranged them with that view as they stand above. *Temperance* first, as it tends to procure that coolness and clearness of head, which is so necessary where constant vigilance was to be kept up, and a guard maintained against the unremitting attraction of ancient habits and the force of perpetual temptations. This being acquired and established, *Silence* would be more easy; and my desire being to gain knowledge at the same time that I improved in virtue; and considering that in conversation it was obtained rather by the use of the ear than of the tongue, and therefore wishing to break a habit I was getting into of *prattling*, *punning* and *jesting*, (which only made me acceptable to trifling company) I gave *Silence* the second place. This and the next, *Order*, I expected would allow me more time for attending to my project and my studies. *Resolution* once become habitual, would keep me firm in my endeavors to obtain all the subsequent virtues. *Frugality* and *Industry* relieving me from my remaining debt, and producing affluence and independence, would make more easy the practice of *Sincerity* and *Justice*, &c. &c.—Conceiving then, that agreeably to the advice of Pythagoras in his Golden Verses, daily examination would be necessary, I contrived the following method for conducting that examination.

I made a little book, in which I allotted a page for each of the virtues. I ruled each page with red ink, so as to have seven columns, one for each day of the week, marking each column with a letter for the day. I crossed these columns with thirteen red lines, marking the beginning of each line with the first letter of one of the virtues; on which line, and in its proper column, I might mark by a little black spot, every fault I found upon examination to have been committed respecting that virtue, upon that day.

FORM OF THE PAGES.

Hum.	Chas.	Tran.	Clea.	Mod.	Jus.	Sinc.	Ind.	Fru.	Res.	Ord.	Sil.	Tem.		
										*	*		Sun.	
								*	*	*	*		M.	
							*			*			T.	
											*		W.	
										*			Th.	
								*	*	*	*		F.	
										*			S.	

Eat not to dullness: drink not to elevation. INTEMPERANCE.

I determined to give a week's strict attention to each of the virtues successively. Thus in the first week, my great guard was to avoid every the least offence against *Temperance;* leaving the other virtues to their ordinary chance, only marking every evening the faults of the day. Thus, if in the first week I could keep my first line marked T. clear of spots, I supposed the habit of that virtue so much strengthened, and its opposite weakened, that I might venture extending my attention to include the next; and for the following week keep both lines clear of spots. Proceeding thus to the last, I could get through a course complete in thirteen weeks, and four courses in a year. And like him who having a garden to weed, does not attempt to eradicate all the bad herbs at once, (which would exceed his reach and his strength,) but works on one of the beds at a time, and having accomplished the first, proceeds to a second; so I should have (I hoped) the encouraging pleasures, of seeing on my pages the progress made in virtue, by clearing successively my lines of their spots; till in the end, by a number of courses, I should be happy in viewing a clean book, after a thirteen weeks' daily examination.

This my little book had for its motto, these lines from Addison's Cato:

"Here will I hold; if there's a power above us,
(And that there is, all nature cries aloud
Through all her works;) he must delight in virtue;
And that which he delights in must be happy."

Another from Cicero:

"O vitæ philosophia dux! O virtutum indagatrix expultrixque vitiorum! Unus Dies bene, it ex præceptis tuis actus, paccanti immortalitati est anteponendus."

Another from the Proverbs of Solomon, speaking of wisdom or virtue:

"Length of days is in her right hand, and in her left hand riches and honor. Her ways are ways of pleasantness, and all her paths are peace."

And conceiving God to be the fountain of wisdom, I thought it right and necessary to solicit his assistance for obtaining it; to this end I formed the following little prayer, which was prefixed to my tables of examination, for daily use:

"O powerful goodness! bountiful father! merciful guide! Increase in me that wisdom which discovers my truest interest; Strengthen my resolution to perform what wisdom dictates: Accept my kind offices to thy other children, as the only return in my power for thy continual favors to me."

I used, also, sometimes, a little prayer, which I took from Thomson's poems, viz:

"Father of light and life, thou God supreme!
O teach me what is good; teach me thyself!
Save me from folly, vanity and vice,
From every low pursuit; and fill my soul
With knowledge, conscious peace, and virtue pure;
Sacred, substantial, never-fading bliss!"

THE CULTIVATOR—NOV. 1834.

TO IMPROVE THE SOIL AND THE MIND.

ELEMENTS OF PRACTICAL AGRICULTURE.

We have received a highly valuable volume under this title, from the pen of DAVID LOW, Esq. Professor of Agriculture in the University of Edinburgh—comprising *The Cultivation of Plants—the Husbandry of the Domestic Animals, and the Economy of the Farm.* This volume is peculiarly adapted to every class of men engaged in agriculture, or who are about to engage in its labors, and particularly to the instruction of young men who are emulous to excel in this healthful and independent employment. It is so well suited to the wants of our country, that we avail ourselves of the earliest opportunity of extracting from its pages, and intend to continue to extract from them as our limits will permit, such portions as seem best adapted to improve our practice.

"In describing a system of agriculture," our author observes, "it is important, that while it is one which admits of being carried into easy effect, it shall be as perfect as, under this necessary condition, it can be rendered. A rude system of practice will not serve the purpose of useful example. Although the agriculturalist may not be able to reach in all things, the model proposed to him, it is yet important that this model be good in itself, so that his own practice may become as perfect as the circumstances in which he is placed will allow." "The attention of the reader is mainly directed to the essential parts of practice; and while the connexion of agriculture with other branches of knowledge is carefully pointed out, this is in most cases done rather to show the relation between them, than to pursue the subject in detail."

"The application of science to agriculture affords the materials of interesting and useful study. Chemistry ascertains the nature and constituents of soils, the mode of action of manures, and the substances fitted for the nutrition of plants; Botany and Vegetable Physiology treat of the structure, the properties, and the use of plants; animal physiology and Medical Science relate to the form of animals, their properties and diseases; and Mechanics are applied to the construction of machines and rural works."

Clover may always be sown upon small grains with profit. We sowed clover upon four acres of rye and two of barley last spring, and notwithstanding the dry weather, it took well. After pasturing the rye stubble some ten or fourteen days, the autumn feed was sold for $12.50. The barley ground has afforded an abundance of fine feed. Say the six acres required a bushel of seed, at $6, and that the fall feed was worth $18, there will be a profit of $12, or $2 per acre. But the clover lay will furnish at least 30 tons of vegetable food to the next season's crop, if turned under the first of May, which will be no inconsiderable increase to the profits. These littles will make up a handsome aggregate upon a farm in a few years; and there is no economy of this kind which should be considered beneath a farmer's notice. "A penny saved is as good as two-pence earned," as Poor Richard says.

There is one strong reason for using long or unfermented manure for hoed crops, which chemistry furnishes: When the manure begins to rot, it affords to plants moisture as well as food. Unfermented manure consists principally of carbon, oxygen and hydrogen, in a solid form; and these simple substances, too, are to become the constituents of the new plant. But ere they can be incorporated with the new plant, they must be separated from each other, and be reduced to a liquid or gaseous state. As soon as this decomposition begins, two new compounds are formed by chemical process; a part of the oxygen unites with the carbon, and this always in certain proportions, and forms carbonic acid, the principal food of plants. The remainder of the oxygen unites with the hydrogen, and forms water, which serves as a medium to convey this food to the mouths of plants. Thus the whole of the dead plant is transmuted into the living one. Hence soils in which manures are undergoing decomposition, suffer least from drought; hence moisture always abounds under a decomposing mass of straw; and hence I have raised upon a dry sandy soil, and during the last very dry and hot summer, a fine crop of melons, on a layer of 18 inches of straw, deposited dry in a trench, and covered with six inches of earth. The straw became completely decomposed. We would apply these remarks to hoed crops, because long manure is apt to be prejudicial to all the small grain crops, by causing too rank a growth of straw; but it is peculiarly adapted to Indian corn, potatoes, ruta baga, and all the crops raised for the stock or root. We would also admonish against using long manure, especially in a dry state, in hills or in drills, for if the season is dry, decomposition does not take place. But spread, and ploughed under, it will take place in due time on the sandy, gravelly and loamy soils adapted to corn, ruta baga, &c.

To test the quality of Gypsum—for there is a material difference in this mineral—there are two modes recommended, both within the reach of the common farmer. One consists in putting a quantity of it pulverized into a kettle over the fire, and when heated it gives out a sulphurous smell. If the ebullition, or bubbling, which takes place, is considerable, the plaster is good; but if not, it is considered indifferent: and if it remains motionless, like sand, it is thought to be hardly worth any thing.—(*Parkinson.*) The other test of its goodness is obtained by putting the powder alone into an iron pot over the fire, and when it bubbles, like boiling water, it will admit of a straw being trust to the bottom without resistance.

Transplanting.—I have often smiled with incredulity, at Cobbett's suggestion, that plants of cabbages, strawberries, &c. may as well be put out at meridian of a hot sunny day, as during a rain; but I begin to concur with him in opinion, provided the plants are first grouted, and well watered at evening following. Yesterday and the day before, (August 6th and 7th,) the thermometer ranging at 85 to 92 degrees, the sun constantly shining, and during an extremely severe drought, my gardener was employed in planting out strawberries and cellery, the plants being first divested

of their larger leaves, grouted and afterwards watered. They have received no covering, and yet they have hardly wilted, and now appear nearly as fresh as those which have been left in the nursery beds. I do not think I shall lose a plant in two thousand.* My reasoning is this, that the plants, when taken up, being almost wholly devoid of moisture, and the ground extremely warm, the water with which they were supplied, imparted a remarkable vigor to them, and induced them to throw out new fibrous roots in a few hours after they were put into the ground. *To grout plants*, take any small vessel, or dig a hole eight or ten inches in diameter in the ground, put into it water and stir in earth till the mixture is of the consistence of porridge; into this dip and fully saturate and coat the roots of the plants. Plant with a *dibble*, a piece of a hoe or spade handle, 15 inches long, sharpened at one end; make a hole with this of sufficient depth for the plant, insert the roots, then enter the dibble a second time, an inch or two from the first hole, directing its point to the bottom of that hole, and when low enough, press the top of the dibble briskly up to the plant, thus bringing the earth in contact with all the roots, and afterwards closing the first hole. I have seen 500 plants put out in 30 minutes, in this way, by an expert man, the plants being dropped for him.

Canaan Centre, Oct. 27th, 1834.

J. BUEL, Esq.—Sir—I send you the result of a trial I made on the different methods of curing corn. Soon after the first frost that injured corn leaves, I cut off two rows through a small piece by the ground, and set them up around standing hills, in the usual way.—On four adjoining rows, two on each side, I topped four hills and left four without topping. On gathering it, I was very particular to keep each parcel by itself, and weigh them accurately, and found the result as follows: On the hills not topped, which were equal to two entire rows, I had two hundred and sixty-seven and one-fourth pounds. On the same number of hills topped, I had two hundred and forty pounds, and on the two rows cut off by the ground, I had two hundred and sixty-one pounds.

In trying the above experiment, I have satisfied myself that I, as well as most other farmers, have been wrong in supposing that topping corn would facilitate the ripening, as what I topped was evidently not as sound, and had more soft ears than either of the other parcels.

DANIEL S. CURTIS.

TOASTS DRANK AT CATTLE FAIRS IN MASSACHUSETTS.

Our anniversary celebration—Its foundation is the earth, its support industry, temperance and enterprise.

Two modern scourges—The Asiatic cholera and the ultra party spirit—both spasmodic and fatal. The first produces physical, the other moral and political death.

The present generation—With our cup of blessings running over, we are dissatisfied and are destroying our best institutions, in the vain hope of the golden egg.

The high party press—A sort of safety valve, through which high pressure politicians corrupt the political atmosphere by letting off their gas, till at length they burst their own boilers and blow themselves sky-high.

Fat cattle and fat offices—The one fills the farmer's pockets, the other empties them.

The working class of our citizens—Our *support* in peace, and *defence* in war. The bone and muscle of a Republic is the product of its soil.

The yeomenry of Massachusetts—In their selection of an overseer and other agents for the *State Farm*, should they exercise the discretion they evince in the concerns of *their own*, the *best* will be employed.

CUTTING GRAIN BEFORE RIPE.

For seed, we believe it is recommended to let wheat become fully ripe. For flour, Mr. M'Culloch says:—"I had a part of my wheat field cut about ten days sooner than the residue—it was kept separate, and when recently brought to the mill with the wheat cut from the same field at the usual time, the early cut wheat weighed two pounds to the bushel heavier than the other. The flour made from it (there were ten bushels) is remarkably fine, equal to any I ever had in my family, and superior to any I have had this year from any other wheat. I think it proper to make these facts known although I would not say that a single experiment like this ought to establish a general rule."

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* Sept. 12. On carefully looking over the plants, I find that nine have died.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

1. SOILS.

1. *The Classes of Soils, and their properties, as determined by external characters.*

The Soil is the upper portion of the ground in which plants are produced. It forms a stratum of from a few inches to a foot or more in depth. It is usually somewhat dark in colour, arising from the mixing with it of the decomposed stems, leaves, and other parts of plants which had grown upon it, and in part often by the presence of animal substances. It is this mixture of organic bodies, in a decomposed or decomposing state, with the mineral matter of the upper stratum, which distinguishes this stratum from the subjacent mass of earth or rock, to which the term subsoil is applied. The decomposable organic portion of the soil may be termed *mould;* and it is the presence of mould, accordingly, which distinguishes the soil from the subsoil.

Soils are very various in their fertility and texture. With relation to their power of producing useful plants, they may be termed rich or poor: with relation to their texture, they may be termed stiff, and free or light. The stiff soils are those which are tenacious and cohesive in their parts; the light or free soils are those which are of a looser texture, and whose parts are easily separated. But the cohesive soils pass into the loose, by imperceptible gradations, and hence, though all soils may be termed rich or poor, stiff or light, they are so in every degree of fertility and texture.

All soils which possess this tenacious or cohesive property in a considerable degree, are termed *clays*, or clayey soils; while all the looser soils are termed *light* or *free*. And all soils are more or less clayey, or more or less light, as they possess more or less of this tenacious or cohesive property or of this looser texture.

The fertility of soils is, *cæteris paribus*, indicated by the greater or smaller proportion of mould which enters into their composition. When soils are thus naturally fertile, or are rendered permanently so by art, they are frequently termed *loams*. Thus there are clayey loams and light loams; and peat itself may, by the application of labor and art, be converted into loam.

The parts of plants which grow upon the surface, and are mixed with the mineral matter of the soil may decompose and become mould. Under certain circumstances, however, the plants which have grown upon the surface do not decompose, but undergo a peculiar change, which fits them to resist decomposition. They are converted into what is termed peat, and the soils formed of this substance are termed *peaty*. The peaty soils are the lighter class, and are distinguished from all others by peculiar characters.

Soils, then, may be distinguished from each other:—

1st. According to their texture, in which case they may be divided into two classes—1, the stiff, denominated clays; 2, the light or free, comprehending the peaty.

2. According to their fertility or power of producing useful plants, in which case they are termed rich or poor.

Soils, too, from particular causes, may be habitually wet or habitually dry. Soils, therefore, may be further distinguished by their general relation to moisture. When water, from any cause, is habitually abundant, the soils may be termed wet; when not habitually abundant, they may be termed dry.

Subsoils, it has been said, are distinguished from soils properly so termed by the absence of mould. Plants, in growing, may extend their roots into the subsoil, and decomposing there, mix with it.—But this is in small quantity, and for the most part the subsoil is readily distinguishable by the eye, from the upper stratum or soil, by the absence of organic matter, in a decomposed or decomposing state.

Subsoils may either consist of loose earthy matter, like the soil, or they may consist of rock. Subsoils, therefore, may be divided into two classes, the rocky and the earthy.

When the soil rests directly upon and extends to the rock, without any intervening bed of looser earthy matter, the soil will frequently be found to be similar in the composition of its mineral parts to the rock upon which it rests, it having been formed by the gradual disintegration of that rock. This is chiefly found to be the case with the soils of mountains; for, in plains, the soil is generally formed, not by the disintegration and decomposition of the rock upon which it rests, but by the intermixing together of the disintegrated parts of different rocks and mineral strata.

The rocky subsoils consist of granite, sandstone, limestone, chalk, and other mountain rocks of a country. They are sometimes easily penetrated by the water that falls upon the soil, and are then termed free or porous; and sometimes they resist the percolation of water, when they are termed close or retentive.

The earthy subsoil, may, in like manner, be divided into the close or retentive, and the free or porous. The retentive are those which, from containing clay, are tenacious and cohesive in their parts, and little pervious to fluids: the porous are those which, having less of clay in their composition, are more readily permeable.

Whether the subsoil be retentive or porous, the soil which rests upon it should be of good depth. If the soil be shallow on a retentive subsoil, it is affected too greatly by the alternations of dryness and moisture. And if, again, a shallow soil rest upon a porous subsoil, the moisture of the soil is too easily acted upon and exhausted by heat.

A subsoil, in so far as mere texture is concerned, should be neither too retentive nor too porous. But although this intermediate condition is, in most cases, the best, yet in a very cold and moist country, a free or porous subsoil is, for the most part, to be preferred to one which is close and retentive. The soil besides being affected by the texture of the subsoil, is sometimes also affected by the nature of the mineral substances of which the subsoil is formed.

If the subsoil be rocky, it is desirable that it be calcareous rather than silicious,—chalk or limestone, for example, rather than quartz. Sometimes the subsoil contains matter which is directly injurious to the growth of plants. This matter is generally found to be the oxides of metals in combination with acids. Subsoils of this kind are usually distinguished by deepness of color.

Soils, then, it is seen, are affected in their properties not only by their own texture and composition, but by the texture and composition of the subsoil; and they are divided into the stiff or clayey, and the light or free.

The clayey soils have, as their distinguishing character, the adhesiveness of their parts; and this property alone will enable even the inexperienced to discriminate them. A stiff clay when dried either by natural or artificial heat, becomes so hard as to resist a considerable mechanical pressure. On account of the tenacity of such soils, they are tilled with more difficulty than the freer soils. They require, to fertilize them, a larger proportion of manures; but they retain the effects of these manures for a longer time. They are better suited to the cultivation of plants, with fibrous than with tuberous or bulbous roots. Soils of this class, as of every other, possess many degrees of natural fertility. The poor clays form, for the most part, a very unprofitable soil, because, while their powers of production are inconsiderable, the expenses of tilling them are large. The clay soils of this character are generally of little depth, and rest upon a retentive subsoil. The natural herbage they produce is coarse and little nutritious, and they are not well suited to the production of the cultivated grasses and other herbage plants. They are little fitted for the growth of turnips or other plants with bulbous and tuberous roots. Such soils have every where local names which sufficiently denote their qualities. They are termed, by a not improper figure *cold* soils; and sometimes they are classed under the general name *moor*, which term is often used to denote soils, whatever be their nature, of a low degree of fertility.

Very different in their value and nature, are the richer clays.—These bear weighty crops of all the cultivated kinds of corn:* they do not excel the better soils of other classes so greatly in the production of oats, and still less in that of barley, in which lighter soils loams may surpass them; but they are unequalled for the production of wheat, and in many places derive their descriptive appellation from that circumstance, being termed *wheat* soils. They are well suited for the growth of the bean,† a plant with a weighty stem, and requiring a stiff soil to support it. They will yield large returns of the cultivated grasses, and leguminous herbage plants,‡ though they are not so quickly covered with the natural herbage plants of the soil, when laid down to perennial pasturage, as the lighter soils.

Clays, like other soils, approach to their most perfect condition as they advance to that state which has been termed loam. The effect of judicious tillage, and of the application of manures, is to improve the texture of such soils, as well as to enrich them. Thus, clays in the neighborhood of cities become dark in their colour, and less cohesive in their texture, from the mixture of animal and vegetable matter, and thence acquire the properties of the most valued soils of their class.

Natural changes, however, yet more than art, have furnished the rich soils of clay. The best, for the most part, of the soils of clay, are those which are formed from the depositions of rivers or the sea. The finest natural soils of this and other countries are those which are thus formed. The deposition of rivers, indeed, are not always of a clayey nature. In mountainous districts, they generally form soils of the lighter kinds. Where the sea, however, is the agent or where both the rivers and the tides combine their action, the depositions generally partake of the nature of clay. Such alluvial soils have every where local terms to mark their character and fertility. On the great rivers and estuaries in England, and in what are termed *carses* in Scotland, fine and extensive districts of this kind exist. The next class of soils is the light or free. These are readily distinguished from the last by their smaller degree of tenacity. They are less suited for the production of wheat and beans than the clays, but they are better suited for the production of plants cultivated for their bulbs and tubers, as the turnip and the potato.

This class of soils may be divided into two kinds, or sub-classes, differing from each other in certain characters, but agreeing in the common property of being less tenacious in their parts than the clays.

The first of these sub-classes of the lighter soils has been termed the sandy.

The sandy soils are of all the degrees from barrenness to fertility. When wholly without cohesion in their parts, they are altogether barren, and are only rendered productive by the admixture of other substances. The cultivated sands part readily with their moisture on the application of heat. They do not become hard like the clays, and, making no considerable resistance to external pressure, they are tilled with little labor.

The poorer sands are almost always marked by the scantiness of their natural herbage. This character they possess in common with the poorer gravels. Other soils, even the poorest, may be thickly covered with the plants peculiar to them; but the poorer sands and gravels put forth their natural herbs with a sparingness which denotes the absence of vegetable nourishment.

But sand, without losing its distinctive characters as a soil, may possess a greater cohesiveness in its particles, and be fertile by nature, or rendered so by art, and then the soils denominated sandy become of deserved estimation. Rich sands are early in maturing the cultivated plants, and thence they are familiarly termed *kindly* soils. They are fit for the production of every kind of herbage and grain. They yield to the richer clays in the power of producing wheat, but they surpass them in the production of rye and barley. They are well suited to the growth of the cultivated grasses; and, when left in perennial pasture, they are quickly covered with the natural plants of the soil. But their distinguishing character is their peculiar adaptation to the raising of the plants cultivated for the bulbs and tubers of their roots.*

The next division of the lighter soils, and allied in the character to the sandy, is the gravelly.

Sands will frequently be found to be the production of flat countries, gravels of the mountainous and rocky. The characteristic of the gravelly soils is the quantity of loose stones which they contain. These stones will be found to consist of those varieties of rock which the mountains of the country afford; and the nature of these rocks will frequently indicate the character of the soil; thus soils, of which the stony matter is very silicious, are generally found to be barren, while those of which it is calcareous, are found to be fertile.

Sands, upon examination, will be found to consist of small particles of stony matter, and thus sands may be said to differ only from gravels in the more minute division of their parts. Yet, in this minuteness of division, there is generally sufficient to distinguish the two kinds of soils. The stony matter of the sand forms its principal component part, while the larger stones in the gravel, which give to it its name and its character, seem only to be mixed with the other necessary parts of the soil. The stone of the one has undergone a

* This term applies in Europe, to wheat, barley and the other small grains, and not to Indian corn, as in the United States.

† The bean here alluded to is the horse bean, little cultivated here, and not the kidney bean which we grow.

‡ As peas, beans, &c.

* And to the culture of Indian corn.

considerable mechanical division, while much of that of the other has only been loosened, in sensible masses, from its native bed. Any light soil, mixed with a sufficient portion of stones, is gravel: and gravel, therefore, is nothing else than the different kinds of light soils, mixed with a greater or less proportion of stones.

Gravels, like sands, have all the gradations of quality, from fertility to barrenness. The loose soils of this nature, in which the undecomposed material is great, and the intervening soil silicious, are held to be the worst of their kind. These are in some places, termed *hungry* gravels, not only to denote their poverty, but their tendency to devour, as it were, manure, without any corresponding nourishment to themselves. As the texture and quality of the intervening earth improve, so does the quality of the entire soil; and gravels, like sands and clays, advancing through all the intermediate degrees, may become, at last, of great fertility. The rich gravels will produce all the cultivated kinds of grain. Their looser texture renders them less suited than clays to the growth of wheat and beans, but they are admirably adapted to the growth of barley and oats. They are quick in their powers of producing vegetation; and, from this quality, they are, in some places, termed *sharp* or quick soils. They readily admit of alternations of herbage and tillage, and improve in a state of perennial pasturage. They are generally trusty soils with regard to the quality of the grain which they yield; and in this respect, they differ from many of the sands, in which the quality of the grain produced does not always accord with its early promise. It is well, then, even in the best sands, to see a tendency to gravel, which denotes a sharpness, as it is termed, in the soil. Gravels, like sands, are suited to the culture of the different kinds of plants raised for the bulbs and tubers of their roots; and they are in so peculiar a degree suited to the growth of turnips, that, in some parts, they receive the distinguishing appellation of *turnip* soils.

The last division of the lighter soils consists of those which are termed peaty.

The matter of the soils of this class is dark in its colour, spongy in its texture, and full of the stems and other parts of plants, either entire or in a state of partial decay. It is generally tough and elastic; and, when dried, loses greatly of its weight, and becomes inflammable. These, the most observable characteristics of the soils termed peaty, will distinguish them, in their natural state, from every other; and even when they shall have been greatly improved by culture, enough of their original characters will remain to make them known.

Peat, it has been said, consists of vegetable matter which has undergone a peculiar change. Under a degree of temperature not sufficiently great to decompose the plants that have sprung upon the surface, these plants accumulate; and, aided by a certain degree of humidity, are converted into peat, which is either found in strata upon the surface of plains, or accumulated in great beds upon the tops and acclivities of mountains, or in vallies, hollows and ravines. Successive layers of plants being added to the mass, it continues to increase, under circumstances favorable to its production. Water is a necessary agent in its formation, and we may believe too, a peculiar temperature, since it is only in the cold and temperate, and not in the warmer regions of the earth, that it is found to be produced. The plants which form it have not entirely decayed, but still retain their fibrous texture: and from the action of certain natural agents, have acquired properties altogether distinct from those which, in their former condition, they were possessed of. They have now formed a spongy, elastic, inflammable body, and so different from the common matter of vegetables, as to be highly antisceptic.

The plants whose progress towards decompositon has been thus arrested, are very various. Over the greater part of the surface of the primary and transition districts of colder countries, the peat is chiefly formed of mosses, and other cryptogamic plants, mixed with the heaths and other plants which had grown along with it. Sometimes the peat has been formed in swamps and lakes, and at other times the humidity of the climate has been sufficient to form it in one continued bed, covering the whole surface of the country.

Of the heaths which enter into the composition of peat, that hardy species the common ling, *Calluna vulgaris*, is the native inhabitant of the alpine countries of northern Europe, and grows in vigor, and overspreads the surface, where hardly any other of the larger plants could live. But although this and other species of heath are very generally converted into peat, this not necessarily or universally so. By the growth and decay of the roots and stems, a soil is indeed formed; but then this may take place in the same manner as in other soils, and without the actual conversion of the upper stratum into peat. This, however, in the case of the cold and moist countries of the north of Europe, is comparatively rare, for, generally the plants, from the slowness of decomposition of their ligneous roots and stems are wholly or partially converted into peat. In the cases in which, these plants are not converted into peat, a dry and turfy soil is formed, very different in aspect from that formed by the gramineous and other easily decomposed plants, but still produced in the same manner, though, like the peaty soils, elastic and inflammable, on account of the greater quantity of ligneous matter in its composition. The soil itself is generally thin and little favorable to vegetation. It usually rests upon a subsoil of silicious sand, and sometimes of chalk, and then it is comprehended under the class of soils termed light.

The soil formed of peat would, from its vegetable composition, seem to contain within it the necessary elements of fertility, and yet this is not found to be so. The excess of vegetable matter which it contains is injurious rather than useful. In the state of nature, it is often found to be as barren as the sand of the desert, and scarcely to deserve the name of soil until the labor of art has been extended to its improvement, and even then it is not entirely divested of its original characters.

The effect of thorough draining off the water of peat, continued for a long time, is to carry away the antisceptic matter which it contains. When the water of peat ceases to be turbid and comes off clear, then we have the assurance that the peat is freed of the principles injurious to vegetation. This is the greatest improvement of which peat is susceptible, and when we have brought it to this condition, the main difficulty of improving it has ceased.*

Peat may then be brought to the state of what has been termed loam. In this ameliorated condition it becomes a soil of the lighter kind, well suited to the culture of the larger rooted plants. It is dark in its colour like the richest vegetable loam, and to the experienced eye, may pass as such. But still, unless greatly corrected in its texture by the application of the earths, it is found to be porous and loose, too quickly saturated with moisture, and too easily freed from it. In this improved condition, it will yield bulky crops of oats and barley, although the quantity of the grain will not always correspond with the weight of the stem, nor the quality of the grain with its quantity.

Soils, then, we have seen, may be distinguished according to their texture and constitution, when they may be divided into two classes —the stiff or strong, denominated clays—the light or free, subdivided into the Sandy, Gravelly and Peaty; and all these again, may be distinguished,

1st. According to their powers of production, when they are termed Rich or Poor; and,

2d. According to their habitual relation with respect to moisture, when they are termed Wet or Dry.

This simple nomenclature of soils, is sufficiently intelligible to the practical farmer. The farmer chiefly regards soils with relation to their fertility, and the means of cultivating them, and he naturally classifies them according to these views. A main distinction between soils, in practice, is founded upon their comparative productiveness, and this is the distinction which is most important with regard to mere value. We constantly refer to soils with reference to their good or bad qualities, without adverting to the particular circumstances which renders them of good or bad quality. We speak familiary, for example of land worth 40s. 50s. and 60s. the acre, without considering whether it be a fertile clay, a fertile sand, or a highly improved peat. We speak of it with reference to its fertility and value alone. But those other distinctions, which are derived from its constitution and texture, are essential when we regard the manner of cultivating such a soil; for the same method of tillage, and the same succession of crops, as will be afterwards seen, do not apply to all rich or to all poor soils, but are determined by the character of the soil, as derived from its other properties.

Though soils are thus distinguished by external characters, they pass into each other by such gradations, that it is often difficult to say to what class they belong. These intermediate soils, too, are the most numerous class in all countries. The soils termed peaty, indeed form a peculiar class, always marked by distinctive charac-

* These characteristics of peat do not *generally* apply to the matters found in our swamps and marshes. We have no heaths, and the vegetable matter is more broken down by the heats of our summers than it is in the north of Europe. Draining, in most cases, converts our swamps into productive soils.

ters; but even these, when mixed with other substances, pass into the earthy soils, by imperceptible gradations. We may say, therefore that the great part of soil consists of an intermediate class, and that it is often difficult to bring them under any division, derived from their texture alone. Such soils, however, can always be distinguished by their powers of production. They are good, bad, or intermediate between good and bad; and their relative value is determined by the produce, which, under similar circumstances, they will yield.

Cattle Husbandry.

(From the Edinburgh Quarterly Journal of Agriculture for Sept. 1834.)

ON THE POINTS BY WHICH LIVE-STOCK ARE JUDGED.

BY JAMES DICKSON.

Were an ox of fine symmetry and high condition placed before a person not a judge of live-stock, his opinion of its excellencies would be derived from a very limited view, and consequently from only a few of its qualities. He might observe and admire the beautiful outline of its figure, for that might strike the most casual observer. He might be pleased with the tint of its colours, the plumpness of its body, and the smoothness and glossiness of its skin. He might be even delighted with the gentle and complacent expression of its countenance. All these properties he might judge of by the eye alone. On touching the animal with the hand, he could feel the softness of its body, occasioned by the fatness of the flesh. But no man, not a judge, could rightly criticise the properties of an ox farther. He could not possibly discover, without tuition, those properties which had chiefly conduced to produce the high condition in which he saw the ox. He would hardly believe that a judge can ascertain, merely by the eye, from its general aspect, whether the ox were in good or bad health;—from the colour of its skin, whether it were of a pure or cross breed;—from the expression of its countenance, whether it were a quiet feeder;—and from the nature of its flesh, whether it had arrived at maturity or no. The discoveries made by the hand of a judge might even stagger his belief. He could scarcely conceive that that hand can feel a hidden property,—the touch,—which of all tests is the most surely indicative of fine quality of flesh, and of disposition to fatten. It can feel whether that flesh is of the most valuable kind; and it can foretell the probable abundance of fat in the interior of the carcass. In short, a judge alone can discriminate between the relative values of the different points, or appreciate the aggregate values of all the points of an ox. The parts of the ox by which it is judged are called "*points.*"

We have thus seen that a person even totally ignorant of cattle may judge of some of the most apparent properties or points of a *fat* ox; but were a *lean* ox placed before him, he would be quite at a loss what opinion to pass on its present, and far more of its future, condition. The outline of its figure would to him appear rugged and angular, and consequently coarse. To him the body would feel a number of hard bones, covered with tough skin and coarse hair. A judge, on the other hand, can at once discover the good or the bad points of a lean as well as of a fat ox; because the properties of the former are the same in kind, though not in degree, as those of the latter; and in accordance with the qualities of these points, he can anticipate the future condition of the lean ox, save and excepting the effects of accidents and disease.

But, it may be asked, if a judge of cattle is a character so easily attained as is here represented, how is it that the opinion of a judge is always held in deference, and is always referred to in cases of difference of opinion? This question admits of a very satisfactory answer. Errors in the judging of cattle arise not so frequently from not knowing the points to be judged of, as from judges allowing one or more of their favorite points the power of too great an influence over the future increasing condition of the ox; and as long as there are so many points to be considered, and as most of them may be partially altered by local circumstances, a difference of opinion may exist among judges of lean stock.

Now, what are those *points* of an ox, a thorough knowledge of which is so essential to constitute a perfect judge? Could they be described and illustrated with such precision, as that they may be applied at once to every ox, in whatever condition it may be, a great advancement would be made towards establishing fixed rules for the right judging of all the domestic animals. Fortunately for the suppression of human dogmatism on this subject, Nature herself has furnished rules for ascertaining points for judgment, which can only be discovered by long and constant practice. Nevertheless, I shall endeavor to describe them plainly, and after perusing the description, I hope my readers will perceive that they are established laws of nature; and are therefore unerring and applicable to every species of cattle. Like other phenomena of nature, a knowledge of them can be acquired by observation. This knowledge is the most difficult which a farmer has to acquire, inasmuch as the management of live-stock is a much more difficult branch of husbandry than the cultivation of corn. And although the importance of this knowledge is acknowledged by every experienced farmer and a desire for its acquirement is strongly felt by every young one, it is remarkable that very little is said in professed works on agriculture on those rules which guide us in judging of fat or lean live-stock.

The first *point* to be ascertained in examining an ox is the *purity* of its breed, whatever that breed may be. The ascertainment of the purity of the breed will give the degree of the disposition to fatten in the individuals of that breed. The purity of the breed may be ascertained from several marks. The colour or colours of the skin of a pure breed of cattle, whatever those colours are, are always definite. The colour of the bald skin on the nose, and around the eyes, in a pure breed is always definite, and without spots. This last is an essential *point*. When horns exist they should be smooth, small, tapering, and sharp-pointed, long or short, according to the breed, and of a white colour throughout in some breeds, and tipped with black in others. The shape of the horn is a less essential point than the colour.

Applying these marks on the different breeds in Scotland as illustrations of the points which we have been considering, we have the definite colours of white and red in the Short Horns. The colour is either entirely white or entirely red, or the one or the other predominates in their mixture. The skin on the nose and around the eyes is uniformly of a rich cream colour. The Ayrshire breed in its purity is also distinguished by the red and white colour of the skin, but always mixed, and the mixture consists of spots of greater or smaller size, not blended together. The colour of the skin on the nose and around the eyes is not definite, but generally black, or cream coloured. In other points, those two celebrated breeds differ from one another more than in the characters which I have just described. In the West Highland, Angus, and Galloway breeds, the colour of the skin is mostly black in the animals of the purest blood, although red, dun, and brindled colours, are occasionally to be seen among them. The black colour of the skin of the nose and around the eyes is indicative of the pure blood of black-coloured cattle, but a cream-coloured nose may frequently be observed among the other colours of skin. It would perhaps be hazardous to assert, in the case of the West Highlanders, that the characters above given are the only true indications of the pure breed, for their origin cannot now be certainly determined; but the characters given will certainly apply to the purity of the blood in the Short-Horns and Ayrshire breeds.

The second *point* to be ascertained in an ox is the form of its carcass. It is found, the nearer the section of the carcass of a fat ox, taken longitudinally vertical, transversely vertical, and horizontally, approaches to the figure of parallelogram, the greater quantity of flesh will it carry within the same measurement. That the carcass may fill up the parallelogram as well as its rounded form is capable of filling up a right-angled figure, it should possess the following configuration. The back should be straight from the top of the shoulder to the tail. The tail should fall perpendicularly from the line of the back. The buttocks and twist should be well filled out. The brisket should project to a line dropped from the middle of the neck. The belly should be straight longitudinally, and round latterally, and filled at the flanks. The ribs should be round, and should project horizontally, and at right angles to the back. The hooks should be wide and flat; and the rump, from the tail to the hooks, should also be flat and well filled. The quarter, from the itch-bone to the hook, should be long. The loin-bones should be long, broad, and flat, and well filled; but the space between the hooks and the short-ribs should be rather short, and well arched over with a thickness of beef between the hooks. A long hollow from the hooks to the short ribs indicates a weak constitution, and an indifferent thriver. From the loin, the shoulder-blade should be nearly of one breadth; and from thence it should taper a little to the front of the shoulder. The neck-vein should be well filled forward, to complete the line from the neck to the brisket. The covering on the shoulder-blade should be as full out as the buttocks. The middle ribs should be well filled, to com-

plete the line from the shoulders to the buttocks along the projection of the outside of the ribs.

These constitute all the *points* which are essential to a *fat* ox, and which it is the business of the judge to know, and by which he must anticipate whether the lean one, when fed, would realize. The remaining points are more applicable in judging of a lean than a fat ox.

The first of the *points* in judging of a *lean* ox, is the nature of the *bone*. A round thick bone indicates both a slow feeder, and an interior description of flesh. A flat bone, when seen on a side view, and narrow, when viewed either from behind or before the animal, indicates the opposite properties of a round bone. The whole bones in the carcass should bear a small proportion in bulk and weight to the flesh, the bone being only required as a support to the flesh. The texture of the bone should be small grained and hard. The bones of the head should be fine and clean, and only covered with skin and muscle, and not with lumps of fat and flesh, which always give a heavy-headed dull appearance to an ox. The forearm and hock should also be clean and full of muscle, to endure travelling. Large joints indicate bad feeders. The neck of an ox should be, contrary to that of the sheep, small from the back of the head to the middle of the neck. The reason of the difference, in this respect, betwixt the ox and the sheep, is, that the state of the neck of the ox has no effect on the strength of the spine.

A full, clear and prominent eye is another *point* to be considered; because it is a nice indication of good breeding. It is always attendant on fine bone. The expression of the eye is an excellent index of many properties in the ox. A dull heavy eye certainly indicates a slow feeder. A rolling eye, showing much white, is expressive of a restless capricious disposition, which is incompatible with quiet feeding. A calm, complacent expression of the eye and face is strongly indicative of a sweet and patient disposition, and, of course, kindly feeding. The eye is frequently a faithful index of the state of the health. A cheerful clear eye accompanies good health; a constantly dull one proves the probable existence of some internal lingering disease. The dulness of the eye, arising from the effect of internal disease, is, however, quite different in character from a natural or constitutional phlegmatic dulness.

The state of the skin is the next *point* to be ascertained. The skin affords what is technically and emphatically called the *touch*,—a criterion second to none in judging of the feeding properties of an ox. The touch may be good or bad, fine or harsh, or, as it is often termed, hard or mellow. A thick firm skin, which is generally covered with a thick set, hard, short hair, always touches hard, and indicates a bad feeder. A thin, meagre, papery skin, covered with thin silky hair, being the opposite of the one just described, does not, however, afford a good touch. Such a skin is indicative of weakness of constitution, though of good feeding properties. A perfect touch will be found with a thick, loose skin, floating as it were, on a layer of soft fat, yielding to the least pressure, and springing back towards the fingers like a piece of soft, thick, chamois leather, and covered with thick, glossy, soft hair. Such a collection of hair looks rich and beautiful, and seems warm and comfortable to the animal. It is not unlike a bed of fine soft moss, and hence such a skin is frequently styled "mossy." The sensation derived from feeling a fine touch is pleasurable, and even delightful, to an amateur of breeding. You cannot help liking the animal that possesses a fine touch. Along with it is generally associated a fine symmetrical form. A knowledge of touch can only be acquired by long practice; but after having acquired it, it is of itself a sufficient means of judging of the feeding quality of the ox; because, when present, the properties of symmetrical form, fine bone, sweet disposition, and purity of blood, are the general accompaniments.

These are the essential *points* of judging *lean* cattle; but there are other and important considerations which must claim the attention of the judge, in forming a thorough judgment of the ox.

The *proportion* which the extremities bear to the body, and to one another, is one of these considerations. The head of the ox should be small, and set on the neck as if it appeared to be easily carried by the animal. This consideration is of great importance in showing cattle to advantage in the market. The face should be long from the eyes to the point of the nose. No face can be *handsome* without this feature. The skull should be broad across the eyes, and only contract a little above them, but should taper considerably below them to the nose. The muzzle should be fine and small, and the nostrils capacious. The crown of the head should be flat and strong, and the horns should protrude horizontally from both sides of it, though the direction of the growth from the middle to the tip varies in the different breeds. The ears should be large, stand a little erect, and so thin as to reflect the bright sun-light through them. The neck should be light, tapering from the front of the shoulder and neck-vein, with a gradual rise from top of the shoulder to the head. The length of the neck should be in proportion to the other part of the animal; but this is a non-essential point, though I would prefer an apparently short neck to a long one, because it is generally well covered with the neck-vein. A droop of the neck, from the top of the shoulder to the head, indicates a weakness of constitution, arising frequently from breeding too near akin. The legs below the knee should be rather short than long, and clean made. They should be placed where they apparently bear the weight of the body most easily, and they should stand wide asunder. The tail should be rather thick than otherwise, a thickness indicates a strong spine and a good weigher. It should be provided with a large tuft of long hair.

The *position* of the *flesh* on the carcass is another great consideration in judging of the ox, the flesh on the different parts of the ox being of various qualities. That part called the spare-rib in Edinburgh, and the fore and middle ribs in London, the loins, and the rump or hookbone, are of the finest quality, and are generally used for roasts and steaks. Consequently the ox which carries the largest quantity of beef on these *points* is the most valuable. Flesh of fine quality is actually of a finer texture in the fibre than coarse flesh. It also contains fat in the tissue between the fibres. This arrangement of the fat and lean gives a richness and delicacy to the flesh. The other parts, though not all of the same quality, are used for salting and making soups, and do not fetch so high a price as the part just described.

A full twist lining the division between the hams, called the "closing," with a thick layer of fat, a thick flank, and a full neck-vein are generally indicative of tallow in the interior of the carcass; but it frequently happens, that all these symptoms of laying on internal fat fail. The disposition to lay on internal fat altogether depends on the nature of the individual constitution; for, it is often observed, that those individuals which exhibit great fattening *points* on the exterior, do not fill with internal fat so well as others which want these points. On the contrary, thin made oxen, with flat ribs, and large bellies, very frequently produce large quantities of internal fat.

The first part which shows the fat in a feeding ox, is the point or top of the rump, which in high-bred animals, is a prominent point; sometimes it protrudes too much, as the mass of *fat* laid on these is out of proportion to the *lean*, and therefore useless to the consumer. This is the part which frequently misleads young or inexperienced judges in the true fatness of the ox, because fat may be felt on this part, when it is very deficient on most of the other points.

The parts on the other hand, which are generally the last in being covered with flesh, are the point of the shoulder-joint, and the top of the shoulder. If these parts are, therefore, felt to be well covered the other and better parts of the animal may be considered ripe. Ripeness of condition, however, can only be rightly ascertained by handling, for there is a great difference between the *apparent* and *real* fatness of an ox. The flesh of an apparently fat ox to the eye, may, on being handled by a judge, feel loose and flabby; but a truly fat ox always feels "hard fat." With such the butcher is seldom deceived, while loose handlers give no assurance of killing well.

It is proper in judging of the weight of a fat ox, to view his gait while walking towards you, which will, if the ox has been well fed, be accompanied with a heavy rolling tread on the ground. In this way a judge can at once come very near to its weight.

The application of all these rules and considerations to the judging of *lean* stock constitutes the chief difficulty to the judge. An ox, in high condition, in so far as its condition alone is under consideration, can be judged of, as we have seen, by any one; and sometimes the fatness may be so great as obviously to deform the symmetry to any observer. The superiority of a judge to others, in these cases, consists in estimating the weight, observing the purity of the blood, and valuing the points of the animal. But in judging of a lean ox, its future condition and symmetry must be foreseen. The rules which I have attempted to describe, will, if studied practically, enable an inquiring observer to foresee these points; and in judging between a number of valuable points, it should be remembered, that purity

of breeding will always insure aptitude to fatten, which, in its turn, will insure the largest remuneration for the food consumed.

Sheep, both fat and lean, may be judged of by nearly the same rules. The purity of breeding will be seen in the large full prominent eyes, the clean thin bone of the head and legs, and the large thin pricked up ears, set on each side of the top of the head, and in the short, thick, smooth, clear hair of the face and legs. The section of the form of the fat sheep is even more mathematically like a parallelogram than that of the fat ox. The touch of the skin is also the same in kind, and is as sure an indication of the disposition to fatten as in the ox. In regard that wool varies so greatly in the many breeds of sheep, I can only make this general remark on the fleece best suited to every breed, namely, the whole body should be well covered with wool, with the exception of the face and legs, which are always covered with hair. A large covering of wool, not only protects them against the inclemencies of the weather, and the coldness and dampness of the ground, but it supplies a large fleece to be disposed of to the wool buyer. One deviation from the rules of judging cattle, must be made while judging sheep, to which I have already alluded, namely, while the neck of the ox should be thin, that of the sheep should be thick; because a thin necked sheep is found to possess a weak spine, and is generally a bad feeder. A thin neck has thus the same effects on sheep that a small tail has on cattle. As in cattle, a drooping neck in sheep indicates a weakness of constitution, arising from breeding in and in.

Some of the rules for cattle and sheep are applicable to swine. Swine should have broad straight backs, round ribs, thin hair, thin skin, small tails, short and fine muscles, pricked ears, small and fine bones, and round and well turned shoulders and hams.

In conclusion, it is obvious that these rules for judging live-stock are not founded upon arbitrary assumptions. Had no *natural* means of judging existed, man could no doubt have contrived rules to suit his own convenience; and in such a case, he would probably have chosen such as he could have most easily applied; but unless they could be applied to the *growing*, as well as to the *mature* condition of animals, they would be of little value. But we have seen that natural means of judging *do* exist, and although they cannot be easily understood without much observation and practice, yet, by practice they can be acquired, and easily applied to the existing circumstances of the animal, whatever these may be. Any person, it is true, cannot at once perceive that their necessary tendency is to lead to a correct judgment. Long and careful personal observation is requisite to convince the mind of their value in that respect. Tuition, without practical observation, cannot of itself do it. It has been the study of nature, in short, which has enabled man to establish these rules for his guidance; and as all the operations of nature are regulated by general laws, these rules must be of universal application. It is clearly established by observation, as an uniform principle of judgment, that when an ox, in a growing, state, presents a certain degree of purity of breeding, a certain form of body, and a certain kind of handling of its skin, a certain result is undeviatingly exhibited in the mature state from these given premonitory symptoms. Should this result conduce to the acquisition of wealth, we are anxious to possess the growing animal which exhibits such favorable points; and, on the other hand, we are as anxious to avoid the possession of that animal which exhibits unfavorable points, unless at a very depreciated value. Now, it has been ascertained by experience, that pure breeding, perfect form, and fine touch, make the best mature animal. Hence *these points* will insure both the growing and mature animal a ready market and good price; and hence also, that breed which constantly presents these points, deserves, by its intrinsic worth, to be generally cultivated.

Means of Inducing Fertility.

APPLICATION OF LIME.

Those purposes appear to be—first, to render whatever substances may be lodged in the soil, or matter which forms part of it, and which may be injurious to vegetation, either harmless or useful; and thus to prepare the soil for the reception and nourishment of seeds and plants: and secondly, to facilitate the decomposition of putrescible matter, so as to furnish food to vegetables during their growth. It has been proved by careful experiment, that the application of lime is the only known alterative which, upon poor, weak, and weeping clays, has power to heal the soil. With the assistance of water, it suddenly decomposes all animal and vegetable bodies, and when thus spread upon neglected ground covered with heath and moss, the old turf is decomposed, and a saponaceous matter is formed which sinks into the soil, and covers it with sweet herbage. We also know that it imparts a certain degree of vigor to some peculiar plants—as, for instance, sainfoin, the roots of which penetrate far into the interstices of chalk, and grow luxuriantly, though only covered by a slight coat of inferior soil.

It is however an error,—though entertained by many farmers,—to suppose that lime in any state comprises fertilizing properties within itself; and that, without operating upon the soil, or upon the substances which it contains, it is an enriching manure. It does not possess any fertilizing principle in its own composition; it is merely a calcareous earth combined with fixed air, and holding a medium between sand and clay, which, in some measure, remedies the deficiencies of both. But though, when alone, unfavorable to the growth of plants, yet experience shows that it is an ingredient in soils which, whether naturally forming a component part of their substance, so judiciously mixed with them by the husbandman, adds greatly to their fertility, for it has the power of attracting much both from the earth and from the air, which occasions the decomposition of plants, and thus converting them into nutriment, it gives power as to vegetation which, without its operation, would otherwise lie dormant. It also appears to act with great force upon that substance which, being already converted by the decomposition of plants into a species of earth, we call *mould*.

The other causes with which we are acquainted regarding the operation of lime as a manure would lead to a chemical discussion, which could only prove uninteresting to the generality of our readers; we shall therefore confine ourselves to the following observations.

There can be no doubt that it is a most powerful stimulant when applied to deep loams and heavy clays, which contain mould of a nature so sour as to appear to unfit them for the purposes of vegetation; or to land which has been previously either more or less manured with animal or vegetable substances, without any addition of lime or other calcareous matter, in which case it often produces effects far more fertlizing than the application of dung, for its active powers render every particle of the putrescent manure useful; but if the latter be not afterwards repeated at no great distance of time, the soil will, in the course of a few years, become considerably exhausted. In all arable land, however impoverished it may be, either by nature or bad management, there yet always exists some portion of mould, and, on this, a first dressing of lime occasions a sensible improvement of the soil, which soon becomes apparent in the increased product of the crops. A second dressing will also be attended with some apparently good effect; but unless that, and every succeeding repetition, be accompanied with ample additions of farm-yard manure, or other putrescent matter, to supply the loss thus occasioned by the exhaustion of the vegetative power, every future crop will be diminished. The land is then necessarily thrown out of cultivation, and left for a series of years to recover itself under pasture, which, in the course of time, may be effected according to its former condition; but in the interim it is rendered nearly fruitless. It is thus that many thousands of acres in every part of the kingdom have been run to a state of almost total infertility; and it is even said, that the too great use of lime, though apparently judiciously employed by some of the first farmers in the Lothians, has been lately found very detrimental to their crops.

Marsh lands, however, which have been drained, will generally support a repeated and abundant application of lime, because they usually contain a large proportion of matter upon which the stimulating powers of lime are peculiarly adapted to act; and it will be found much better suited to the purpose than dung. On all rich, deep, dry, and loamy soils it may also be applied with effect; for although they contain within themselves the component parts of the best soils, yet they are frequently found to be sluggish and inert; and dung, whether through imperfect fermentation or owing to the want of calcareous matter, often remains dormant in the land until roused by moderate quantities of quick-lime, which, if applied at distant periods, will effectually operate to bring it into activity. It should, however, be turned into the ground some weeks before the dung, in order that it may become thoroughly slaked by mixture with the soil, or otherwise it would have the effect of abstracting some of its nutriment. Such soils, after the application of lime, produce much heavier crops with a much smaller proportion of dung than if no lime

had been used, because the operation of the latter acting upon the dung renders every portion of it useful.

Clay land, shows an evident disposition to combine with lime, and it bears the repetition of this species of amelioration better than lighter soils. When applied to heavy tillage land, either for the purpose of reducing its cohesive properties, or of supplying an additional quantity of calcareous matter, small dressings of lime will have but little effect; and if sand or calcareous earths are to be employed, it is recommended, by a practical farmer of known experience, as more economical to apply them separately than as a compost. It powerfully assists all adhesive soils; and when laid hot from the kiln upon deep clay, it has been known to occasion a very large increase in the following crops. It has also been often observed, in fallowing clayey soils, "that, in wet weather, when a dose of lime has been just given, the land continues more friable, and is less apt to bind up on the recurrence of drought, than where it has been neglected. The grain growing on the well-limed ground preserves its healthy appearance in wet seasons, while that growing on land that has not been limed is yellow and sickly."

Upon *sandy soils*, which seldom abound much in vegetable matter, lime has a mechanical operation, which, by combining with the finer particles of the soil, gives consistence to the staple of the land, and attracting the moisture from the atmosphere, it imparts it so gradually as to be less liable to be hurt by drought in those parching seasons by which crops are injured. It is therefore said to be cooling to hot land; but if it be not also mixed with some portion of clay, with which it may combine, it then is apt to unite itself with the sand, with which it composes a kind of mortar, the effect of which has been already described, and which cannot be dissolved without much difficulty, and the plough often brings hard lumps to the surface of the soil which cannot be easily broken. Thus when such land has been frequently limed, nothing can restore it but the abundant and reiterated application of putrescent manure; the demonstration of which is perceptible throughout many parts of England, where, from possessing a chalky soil without strength to maintain a sufficiency of live stock to furnish dung, the land has in many places been worn out through the inconsiderate use of lime.

On the *exhaustion of land by the application of lime* there is, however, much difference of opinion. It is indeed evident that the continuation of cropping, without an addition of nutritive manure, will ultimately exhaust the best soils; but though their natural fertility be thus aided, it yet cannot depend entirely on that support. This must be apparent if we reflect that land, without any addition of animal or vegetable substance, will still produce crops; for pure sand, clay, and chalk, though each in themselves separately barren, yet, when mixed together, exert chemical influences upon each other, which, by the attraction of the air, the dews, and the rain, the force of the sun, and the generative powers of growing vegetables, effect the production of corn and fruit. It is therefore clear that the land alone is capable of vegetation; but every day's experience proves, that the amount of its products, its fertility, in short, depends in a great degree upon the decomposition of the substances which have been previously converted into vegetable mould, or which are added to it by manure. Any thing whatever may be called manure which, when applied to the soil, either rectifies its mechanical defects, corrects any bad quality, and either stimulates it to yield, or stores it with nutriment. Thus, if lime be laid upon pure sand, although the latter would be rendered more tenacious, and would thereby become more favorable to the germination of vegetables, yet seeds could find no nourishment from either the lime or the sand, and putrescent manure would still be necessary to produce a crop. But if the soil consists of clay and sand, containing animal or vegetable matter in a torpid state of decay, then lime would be preferable to dung. The state of the soil should therefore be minutely inquired into before lime is employed, and it should be only used to give effect to the inert substances with which it may be combined.

By the analysis of soils, we find that all productive earth contains a certain portion of lime; and although we learn from experience that its stimulative powers upon the roots of plants are very great, yet we are but imperfectly acquainted with the extent or the exact manner in which its influence is brought into action, and "we are in a great measure ignorant of the actual changes that are produced upon the earth after this manure has been applied." It would, however, seem that, where it exhausts, it is only by hastening the putrefaction of the animal and vegetable matter in the soil, and by that means applying a larger portion of those substances in a given time than could be otherwise afforded to the growth of plants. It is thus known to produce more luxuriant crops, and it will also consequently enable the farmer to continue his land in tillage, during a certain time, with more effect than if no calcareous manure had been laid on; but, although it may not tend to the deterioration of the original staple of the soil, it can hardly be doubted that it must be thus more promptly deprived of its fertility than if the exhaustion of that vegetable mould with which it had been supplied by nutritive manure were occasioned by a more gradual process of decomposition.

That this is the only way in which effete lime can exhaust land, seems probable from the large quantities of neutralized calcareous earth which are often applied without any bad effects in the form of chalk, shells, limestone-gravel, and the whole tribe of marls. A larger quantity of these is oftener laid on in one year than would be used of lime in half a century, were the land in tillage to be managed according to the custom of some countries; yet it is not generally impoverished, and, in many cases, it is permanently improved.—This, however, is probably occasioned by its combination with other substances, which either counteract its exhausting powers or supply the waste of nutritive matter.

The employment of lime seems to be of the greatest service in the *breaking up of fresh and coarse land*, on which it acts more powerfully than on soil which has been long in cultivation, and indeed the most striking improvements have been effected by its means on moorlands and mountain; but it should be given for the first time abundantly. Such is the usual effect of lime upon arable; upon *grass-land* it is laid in smaller quantities; and in this top-dressing, perhaps the preferable mode is to apply it in a compost with earth; except when the soil consists of clay. When thus spread upon the surface, its action upon the sward is productive of the most palpable improvement, and continues perceptible during a long period. No other manure will create so rapid a change; for it is such an excellennt corrector of acidity, that it tends to produce the sweetest herbage where only the most unpalatable pasture was formerly to be found. This, indeed, is so apparent, that if a handful of lime be thrown upon a tuft of rank, sour grass, which has in former years been invariably refused by cattle, they will afterwards eat it close down. Now, animal dung, when dropped upon coarse benty sward, produces little or no improvement until limed; it then, however, not only augments the crops, but the finer grasses continue in possession of the soil, and the land is then doubly benefitted; for the dung dropped by the stock on which it is pastured, is both increased in quantity, and improved in quality.* Farmers should never consider lime as the food or nourishment of plants, but as an alterative of the soil; never to be used but when nature requires it, either to dissolve noxious combinations, or to form new ones; to bind loose soils, or to diminish excessive cohesion; and to reduce the inactive vegetable fibre into a fertile mould. For such purposes there is not, perhaps, a more valuable article in the whole catalogue of agricultural remedies; but some farmers, who do not reflect upon the subject, when they perceive that lime has once excited the dormant powers of the soil into action, and that good crops succeed for a few years, are apt to draw from thence very false conclusions, and continue liming and tilling without the assistance of putrescent manure, until their land at length is rendered incapable of the production of corn. It has indeed been pertinently observed by a good judge of such matters, "that there is an analogy between the treatment suitable to the animal and vegetable creation. When medicines have removed the cause of their application, they are discontinued, and the patient, rendered weaker by the application, requires some invigorating aliment; in like manner, some time after an effectual liming, the soluble carbon of the rotten dung, or some such restorative, should be applied to the soil to replenish it with what it may have been robbed of by the action of the lime."

In fine, lime should always precede putrescent manures when breaking up old leys for cultivation, for, if the land contains acids, or noxious matter that is poisonous to plants, they will be decomposed and rendered fit for vegetation; and hence the superiority of lime to dung on new lands. But calcareous and putrescent manures

* In Derbyshire the farmers have found that, by spreading lime in considerable quantities upon the surface of their heathy moors, after a few times the heath disappears, and the whole surface becomes covered with a fine pile of grass, consisting of white clover and the other valuable sorts of pasture-grasses. —Anderson's Essays, 4th edit. vol. i. p. 527. Survey of Derby, vol. ii. p. 437; and of Westmoreland p. 235.

operate very differently: "the former, being more stimulant and corrective, help the farmer to an abundant crop at the expense of the soil alone; while the latter furnish the land at once with fertilizing fluids, and will insure a good crop on a place perfectly barren before, and after the application of lime."

Much uncertainty prevails among farmers *regarding the state of lime;* some contending that it should only be applied when hot and powdered, and that when it has been slaked, its effect is comparatively trifling; others maintain the contrary. But these disputants consist chiefly of men whose experience has either been confined to one kind of soil, or who have only used it under particular circumstances, and as they only condemn the system of others because their own has turned out successful, or the reverse, it is not improbable that, in the view they take of the subject, each may be in the right. It will therefore probably be found, that in all cases where the land is constitutionally disposed to receive benefit from a calcareous dressing, that is to say, when it has not been previously limed, on when it has been long laid down and refreshed by grass, or enriched by the application of dung, it is of little importance whether the operation take place when the lime is quick or effete. Upon waste lands, however, its causticity has an evident and necessary effect; for the undecayed vegetables, which abound in all soils in a state of nature, should be speedily decomposed, and it should therefore be spread hot from the kiln. In point of economy, too, there can be no doubt but that it is most thriftily used when laid upon the land in the latter state: for the labor is less; and a smaller quantity will serve the immediate purpose. It is, however, obvious that the choice of circumstances and season is not always in the farmer's power; and that necessity often obliges him to lay it on when completely effete. It has been said, indeed, upon high authority, that caustic lime exhausts the land; but repeated trials have shown that its ultimate effects are equally beneficial in the one state or the other, though there is a more immediate advantage in the employment of quick-lime by the destruction of weeds. A common method is to leave it spread during some months upon clover or sainfoin, not intended to be broken up until the following year,—a plan which is advisable with regard to marl, which partakes of some of the qualities of lime, and is the better if allowed to remain during a season exposed to the atmosphere; but the stimulating properties of quick-lime will be thereby lost; as it will be converted into mere chalk.—Opinion are also much divided respecting its effects when laid upon pasture land which is intended to be kept in grass. There is indeed no question that, in either state, if applied in moderate quantities to a dry soil, or to land that has been completely drained, such a top-dressing will have the most beneficial effect upon the herbage; but it must be admitted, that when laid on quick, it requires more circumspection in its application, and should not be employed in the same quantity as when effete.—*British Husbandry.*

MISCELLANEOUS MANURES.

PEAT MOSS, which is universally considered as an inert mass of half-corrupted vegetable matter, has been long applied to land in different ways, and, when burned, has been already treated of in the Chapter on Ashes. When reduced to that state, it is of course rendered light by combustion, and consequently so portable as to be easily conveyed to any part of the kingdom; but it is only in the immediate neighborhood of bogs that it can be used in its natural state, for, even when dried by exposure to the air, its bulk is too great to admit of its being carried to any great distance, unless at such expense as would render its application as manure unprofitable.

It has been extensively used in its natural state in both Scotland and Ireland, in various parts of which there are large bogs, as well as in some parts of this country; it is, however, very sluggish in becoming reduced, and requires two or three years, with repeated turnings and exposure to the atmosphere, to bring it to anything like the condition of vegetable mould; but being of a cold nature, it is found, by a heavy dressing, to cause considerable improvement in hot, gravelly and sandy soils. When brought to the decayed condition of *bog-mould*, or rich earth, it has also been found highly useful in opening stiff clay land, and has been largely used for that purpose in Ireland; but on mellow friable soils, it is stated to possess too little substance to be of much utility, and it is said it inclines grass-land to the production of moss. It is likewise impregnated with noxious roots and seeds of aquatic grasses, which, when laid on in its raw state, fill the land with those nuisances; and some farmers who have thus applied it, have occasioned such injury to their grass-land, that it has not recovered for several years; though a small quantity of quick-lime sprinkled sparingly over the surface, after the peat is spread, has been known to correct its bad effects.

During many years it has been the practice of farmers residing in the vicinity of fens, to bed their cattle upon dried peat, as they find that the dung and urine occasion it to ferment and become decomposed. This is so common in Ireland, that every peasant who has a few acres of ground, bottoms his dung-stead with stuff drawn from the bogs, that he may thus preserve the *seep* or *gooding*, as he terms it, of his stable manure. They also mix the peat with dung in various proportions—sometimes one-third of the latter, at other times one-half; and in the latter case have in most instances found that the mixture has produced an equal crop with a similar quantity of stable dung. In countries where peat-moss cannot be readily obtained, a proportion of moory soil may be substituted; but it is not advisable that either of these should form the principal part of the compost heap, for neither of them contains fertilizing properties of sufficient power to act in any other way than as alteratives, until effectually decomposed by being judiciously blended with stimulating substances. The difficulty of effecting this decomposition led to frequent disappointment in the application of the manure, and consequently to much difference of opinion regarding its value, until the late Lord Meadowbank happily overcame the objections to its use, by a scientific investigation of its properties, and directions for its preparation in composts with dung, of which the following is a summary:

COMPOSTS.

The peat of which the compost is to be partly formed, should be thrown out of the pit some weeks, or even months, previously, in in order to deprive it of its redundant moisture. By this means it is rendered the lighter and less compact when made up with fresh dung for fermentation; and accordingly, less dung is required for the purpose than if the preparation be made with peat recently dug from the pit. It should be taken to a dry spot, convenient to the field which is to be manured, and placed in a row of the length intended for the midden. When ready to be made up into compost, half the quantity of dung must be carted out, and laid in a parallel row at such a distance as will allow the workmen to throw the rows together by the spade: the compost may thus be laid in the centre, and will form the area of the future heap, which is to be thus formed.

Let the workmen make a layer or bottom of peat about six inches deep, and extending further than the base of the proposed midden, which is to be thrown up in alternate layers,—first, ten inches of dung over the peat, then peat six inches, dung four inches—thus diminishing each layer of dung until the heap rises to a height not exceeding between three and four feet, when the whole should be covered—top, ends and sides—with the remains of the peat; the whole to be put loosely together, and made quite smooth.

In mild weather, seven cart-loads of common farm-yard dung, tolerably fresh made, is sufficient for twenty-one cart-loads of peat-moss; but in cold weather, a larger proportion of dung is desirable. The dung to be used should either have been recently made, or kept fresh by the compression of cattle or carts passing over it; and as some sorts of dung, even when fresh, are much more advanced in decomposition than others, it is necessary to attend to this, for a much less proportion of dung that is less advanced will serve the purpose.

After the compost is made up, it gets into a general heat, sooner or later, according to the weather and the condition of the dung; in summer, in ten days or sooner; in winter, not perhaps for so many weeks, if the cold is severe. It always, however, has been found to come on at last; and in summer, it sometimes rises so high as to be mischievous by becoming fire-fanged. Sticks should therefore be kept thrust into different parts, as by drawing them out occasionally the progress of the fermentation may be ascertained; and if so rapid as to approach to blood heat, it should either be watered or turned over, and a little moss be added. The heat subsides after a time, and with variety proportioned to the season and the perfection of the compost; but, when cooled, it may be allowed to remain untouched till within about three weeks of being wanted; it should be then turned over, upside down, and outside in, and all the lumps broken; after which, it comes into a second heat, but soon cools, and may be taken out for use. In this state the whole appears a black mass, like garden mould, and, it is said, may be used, weight for weight, like farm-yard manure, with which it will fully stand a comparison

throughout a course of cropping.* Sixteen single-horse cart-loads per acre, are indeed, said to have produced comparatively as good a crop as twelve of farm-yard dung.†

By this plan, one ton of dung will ferment three tons of peat; and wherever moss is only two or three miles distant from the farm, this mode of raising manure can be confidently recommended as a great acquisition. His Lordship also tried various experiments on the mixture of animal matter—such as refuse fish, whale blubber, and the scourings of the shambles—with peat, without the addition of any other substance, and found that, in the course of about nine months, a compost formed of one ton of animal substance and 10 or 12 tons of peat, produced a compost of superior power to that composed with dung. He, however, states, that peat prepared with lime alone is not capable of being decomposed when collected in a heap, and has consequently not been found to answer as a good manure; which opinion he supports upon chemical principles, which we need not now discuss, as experience proves that he is mistaken; for not only does peat, when compounded wth a small quantity of lime, obviously undergo tha putrid fermentation, but it is well known to many farmers that such composts form excellent dressings, particularly for grass-lands. In corroboration of which, there is an experiment recorded by the Manchester Agricultural Society, stating that "A compost of 119 tons of peat moss and lime having been laid upon five acres of a poor sandy soil, and harrowed in with oats, an equal quantity of the same compost was laid upon five acres of thin, poor clayey soil, and harrowed in with the seed, which was likewise oats. The crop upon the sandy field was uncommonly heavy; that on the clay land, though inferior, was, however, very abundant, considering the state of the soil previously to the application of the compost."

To this may be added, that lime will operate in composts when used upon land which has been previously exhausted by the application of lime and marl, although it may have failed to act when used by itself; but it is only upon the varieties of deep argillaceous soils that it can be used with advantage. It is, indeed, generally supposed that the power of the compost will be increased if animal or vegetable matter be added; but the mixture of quick-lime and dung can never be advisable, for the lime will render some of the most valuable parts of the dung insoluble.

EXPERIMENTS.

The following experiments upon composts of peat combined with various substances, communicated to Sir John Sinclair by Mr. Arbuthnot, of Peterhead, will tend to show the power of fermentation in occasioning its decomposition, and its consequent probable effect upon the land:

1. Peat-moss was mixed, in the month of November, with rotten sea-ware, in the proportion of 300 cart-loads of the former to 50 of the latter. In January, the midden, having attained the heat of 90 degrees of Fahrenheit, was turned; in March, the operation was repeated; and in the latter end of April, the compost was spread upon 18 acres of land, and immediately ploughed in. On the 15th of May, the field was sown with barley, which produced one-third more than any similar crop from the same land when manured with dung.

2. Another field was manured in the same proportion of composition, with equal parts of cow-dung and sea-ware; the ground was planted with potatoes, and the produce was large and of excellent quality. Turnips, mangel wurzel, and cabbages, were tried with the same manure, and the crops were all luxuriant.

3. The foundation of a midden was laid on the first of May, with 800 cart-loads of peat-moss and 150 of cow-dung. The cattle had been littered with green rushes; which, although they had lain in the dung-pits for more than nine months, showed no signs of decomposition. About the middle of June, 50 hhds. of salt water were therefore thrown upon it, and the fermentation then began very quickly. The heap was first turned in the beginning of July, and some newly slaked lime added to it. By the latter end of August, it was all grown over with chickweed, when it was again turned, and showed the appearance of a total decomposition of all the mass, into mould of a uniform, smooth, soapy-like consistence, of a strong smell.

4. Consisted of three hundred cart-loads of peat-moss and fifty of town-dung. The decomposition was completed as soon as in the former experiment; but the appearance was not equal throughout.

5. Was composed of 200 cart-loads of rough peat-sods, with a leafy sward, mixed together in July with 30 cart-loads of horse-dung, and the fermentation came on more rapidly than in either of the foregoing experiments; probably, however, owing partly to the heat of the weather, as well as the nature of the dung.

6. In this experiment, 300 cart-loads of peat-moss were put up in three layers of equal quantity. The foundation was laid one foot deep with moss, and then 150 gallons of the urine of cattle was thrown upon it. The fermentation came on almost instantaneously, attended with a hissing noise. The other two layers were then put on, when the same effect was produced; eight days afterwards, it was turned, and to all appearance was completely fermented.

APPLICATION.

The practice most usually followed in preparing the compost is to trench and throw the moss up into ridges, at the most convenient time after the autumn sowing, that it may be dried and pulverized by the winter's frost; and towards the latter end of February to turn it over and lay it flat, when it will be found considerably lighter than when it was first dug up. It is then mixed with the dung, and the process of composition already stated is carried through until it is ready to be laid upon the land. When made up in January, such composts are generally in good order for the spring crops; but this may not happen in a long frost. In summer, they are ready in eight or ten weeks; but if there should exist any necessity for hastening the process, that can be effected by a slight addition of ashes, rubbish from old building, or of lime slaked with foul water, and applied to the dung when the compost is being made up.

Doubts have arisen respecting the proper season of laying on this manure—some insisting that it should be applied to spring crops—others, that it should be ploughed in for wheat in the autumn; but we believe that its effects upon the land will, in the long run, be found in either case equal.—*Farmers' Series, &c.*

[*From the Genesee Farmer.*]

CULTIVATION OF MADDER.

Mr. TUCKER—There are consumed in the counties of Oneida and Otsego, by three manufacturing establishments, about two hundred and thirty-four thousand pounds of madder every three years. This article is dug from the ground once in three years. Suppose each acre produced from 1,500 to 2,000 pounds, but say the former, on a common soil, it would require 156 acres of land to produce madder for these establishments; and perhaps the remaining manufactories, cloth dressers and families, use half as much more, making the whole 351,000 pounds, which, at fifteen cents per pound, the average price of best Dutch madder for the last twelve years, is over $50,000. What a large sum to send to foreign countries, for an article which can be cultivated here as well as potatoes! I am well aware that less than 156 acres will produce the above amount; as, according to the quality of the land and cultivation, it will produce from 1,500 to 2,000 pounds of dry madder. I think it will produce 2,000 pounds on land that will yield, in a good year, fifty bushels of corn to the acre. The whole cost of cultivation on rich deep loam, say sandy loam, digging, washing, drying, grinding, rent of land, seed, and interest of money, at 2,000 pounds to the acre, will not exceed seven cents per pound. There are, without doubt, on most farms in these counties, a few acres of land at least, suitable to the cultivation of this article. I consider that the demand will be for years unlimited; as there is not, as yet, in the circle of my acquaintance, more than twenty-five acres under cultivation, nine of which are under my management. The price of American madder, for the three past years, has averaged about twenty-three cents, wholesale. The time for digging, as also for selling the top roots, or seed, is from the 15th of September to the 15th of October; the price at this time is $3 per bushel, by the quantity. These top roots are buried in the fall

* Essay by Lord Meadowbank, pp. 143 to 151. To every 28 cart-loads of compost, when made up, it is also recommended to add one cart-load of ashes: or, if these cannot be had, half the quantity of finely powdered slaked lime may be used; but these additions are not essential to the general success of the compost, though they will tend to quicken the process.

† Gen. Rep. of Scotland, vol. ii. n. p. 55C. In Holland's Survey of Cheshire, it is also mentioned, that three tons of compost made from moss and dung, having been spread on part of a meadow, and three tons of rotten dung upon an equal portion of the same field, it was found that, although the grass on that part which was covered with dung only, came up as soon, and upon the whole grew rather higher than that on the other part, yet the latter was of a darker green, and yielded nearly an eighth more when it came to be cut. —p. 282.

like potatoes, and planted the following spring in drills, six feet apart between the drills, (giving room for a crop of potatoes the first year,) and twelve or eighteen inches apart in the drills. It is better to purchase the seed in the fall, as it will bear transportation much better when the buds are not much started,—and the price is considerably lower. The bottom roots are also dug at this time and washed, (or rinsed if dug from a light soil,) dried, &c. I have, of three year old roots, unengaged, 150 bushels, or enough to plant from 23 to 25 acres.

Mr. James Eaton, of Winfield, Herkimer co. is a successful cultivator and an honorable dealer in the article. There are others also, so that applicants can be supplied to a considerable amount. For more particular information, as to the cultivation of madder, see "Phinney's Calendar, or Western Almanac, for 1834,"—also a communication in the Cultivator for August, in which is stated my success in the cultivation of this root for two or three years past.

As it is not the intention of the subscriber to offer any remarks to the public but what he believes are founded in truth, he respectfully invites editors of newspapers devoted to agriculture and manufactures, to copy some portion of the above into their respective papers—also other editors who may consider the subject important to the public.

A small package of ground madder will be sent, on application to the care of the president or committee of any agricultural society in the state, previous to their annual fair, for the inspection of members interested. RUSSEL BRONSON.

Bridgewater, Oneida co. Sept. 1, 1834.

[*From the American Farmer.*]

QUERIES ON PLASTER OF PARIS.

PROPOUNDED BY MR. JEFFREYS.

The following are the queries, to which Col. Taylor has annexed answers, on plaster of Paris: (See his letter.)

What quantity to the acre have you generally used?

On what soils does the plaster succeed best?

In what way is it best applied to the soil—with, or without ploughing—with, or without other manure?

Have you repeated the application of it? At what intervals, and with what *effect?*

To what kind of grain, succulent, and leguminous crops can it be beneficially applied? And in what way is it best applied to them?

To what kind of grasses can it be beneficially applied? and in what way is it best applied to them?

What has been the increased product per acre, of grain and grass crops, by means of the plaster alone?

What is the result of the experiment which you have made of setting aside 200 acres, half to be cultivated in corn yearly and alternately, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre.*

COL. TAYLOR'S REPLY.

Port Royal, March 4, 1818.

DEAR SIR,—To your questions of the 4th inst. I reply—

1. I sow from three pecks to one bushel of plaster upon an acre.

2. It succeeds upon all soils to which I have applied it; those requiring to be drained excepted.

3. Sown on clover in the spring, it benefits it considerably. Used in any other mode, I plough it in. But I have even discontinued the first practice, from observing, that when plaster is sown and ploughed in with wheat in the fall, a top dressing to the subsequent clover is of little or no use; and from thinking that the effect of the plaster sooner ceases as a top dressing, than when ploughed in. The best ways I think of using it, are in the spring, upon the long manure of the preceding winter, to be ploughed in with it—upon well covered fields to be sown immediately before they are fallowed—in rolling it very wet with seed corn, bushel to bushel, and in mixing it with seed wheat so moist as to let the wheat divide in sowing, in such a quantity as that the land shall not receive less than three pecks to an acre. The latter is chiefly for the sake of the succeeding clover. The wheat is benefitted in a very small degree, but it prevents embezzlement of the seed.

4. I have had a small mill exclusively for grinding plaster during twenty years. In that period I have used several hundred tons, and tried a great variety of experiments, using it every year to considerable extent. I think it a valuable ally of, but by no means a substitute for manure. That there should be intervals of two, three, or four years, between applying it broadcast to the same land. That its effect is graduated by the quantity of vegetable matter upon which it is sown. That upon close grazed land, it does but little good at first, and repeated, would become pernicious; and that it must be united either with the long manure of the winter, or the ungrazed vegetable cover produced in summer.

5. Corn mixed with plaster is sometimes highly benefitted, and almost unexceptionably in a degree, depending chiefly on its alliance with vegetable matter, and occasionally upon the seasons. Its effect upon wheat is before stated. But all crops are ultimately improved by its gradual improvement of the land, including those upon which its effect is not immediately visible. The small crops, vegetable, succulent, or culmiferous, are often benefitted by a mixture with plaster, when planted measure for measure.

6. I have satisfied myself that plaster ought to be used to benefit all kinds of grasses, in the modes explained, and that it ought not to be sown as a top dressing. By improving the land, it benefits all kinds of grasses.

7. It is impossible to say how far the plaster, valued exclusively of its vegetable ally, may have increased the crops of grain. Used as a top dressing to clover (red) on land never before plastered, I have often had that grass increased four fold to a line, dividing it from similar land clover. Spaces left unplastered across large fields, when sown in wheat, have remained visible during the whole season of rest, by the inferiority in luxuriance of a great variety of natural grasses and weeds. The 200 acres you mentioned have never received any manure, and the corn stalks have been taken off. But they have been completely secured against grazing. They now produce threefold more corn than when the experiment commenced. The rest of my farm, having had the manure, will produce fivefold more corn than it could do twenty years ago. The casualties attending wheat, render that a precarious criterion of improvement.

I am respectfully, sir, your most obd't serv't,

JOHN TAYLOR.

* For fear this experiment may not be understood by the question, I will give it more fully in Col. Taylor's own words: "I have set aside 200 acres, (divided into two fields,) half to be cultivated in corn yearly, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre. The repetition of the culture being too quick for a perennial plant, I use the bird foot clover, as we commonly call it, to raise clothing for the land, having found that the plaster operated as powerfully on that as on red clover. One field produces a crop of corn, and the other being enclosed, receives a crop of ungrazed vegetable matter. The succeeding year the ungrazed field is taxed with the crop of corn, and the corn field fed with the ungrazed vegetable In one, the plaster is sown upon the bird-foot clover in March or April, and in the other ploughed in at its fallow. The object of the experiment is to ascertain whether an annual bushel of plaster to an acre, combined with a biennial relinquishment to the soil of its natural vegetable product, will enable it to be severely cropped (cropt) every other year without impoverishment, or with an addition to its fertility. The first effect would suffice to check an evil, every where demonstrating the wretched state of our agriculture: the second would be a cheap and expeditious mode of improving the soil, even where the state of agriculture is good."

G. W. JEFFREYS.

Household Affairs.

[*From the Ohio Farmer.*]

THE FRUIT-DRIER.

Mr. MEDARY:—Having found a fruit-drier a convenience in family economy, I am induced to give a short description of it, and its uses, pro bono publico. Take two boards eighteen inches wide and four feet long, set them on end by the side of the house—on the top nail a cover, extending a little over the front, and leaving an inch open at the back to allow the air to pass freely—make ten or twelve drawers three feet long, three inches deep. The sides of common stuff, the bottoms of half inch stuff, split into narrow slits, and with brads fastened five-eighths of an inch from each other, so as to let the air pass freely; on these slats lay the fruit; the drawers may be taken out on sunny days, and in case of rain, and at night, they can be replaced. In this way the fruit is never moulded, and much labor is saved. The fruit requires no moving, and the drawers can be replaced with very little labor, and the drying goes on in rainy weather and at night. A HOUSE KEEPER.

White maple bark makes a good light brown slate colour. This should be boiled in water, set with alum. The colour is reckoned better when boiled in brass instead of iron.

The purple paper which comes on loaf sugar, boiled in cider or vinegar, with a small bit of alum, makes a fine purple slate colour. Done in iron.

Dairy Secret.—Have ready two pans in boiling water, and on the milk's coming to the dairy, take the hot pans out of the water, put the milk into one of them, and cover it with the other. This will occasion great augmentation in the thickness and quality of the cream.

Corn Husks for Beds.—As soon as the husks of Indian corn are fully ripe, they should be gathered when they are dry in a clear air. The outer hard husks are to be rejected, and the softer inner ones to be fully dried in the shade. Cut off the hard end formerly attached to the cob, and draw the husk through a hatchel, or suitably divide it with a coarse comb. The article is then fit to use, and may be put into an entire sack as straw is, or be formed into a mattrass, as prepared hair is. Any upholsterer can do the work. This material is sweet, pleasant and durable.

Cockroaches.—Take a deep plate or dish, and nearly fill the bottom part with molasses and water; set it near their haunts, with some chips from the shelf to the edge of the dish for the insects to travel upon. In this way they may be caught, and apparently drowned, but will often revive when thrown out of the plate. To render their extermination sure, they should be stamped on, or thrown into a fire.

Young Men's Department.

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

What a sublime idea, for example, is presented to the view by such an object as the planet *Jupiter*,—a globe fourteen hundred times larger than the world in which we dwell, and whose surface would contain a population a hundred times more numerous than all the inhabitants that have existed on our globe since the creation! And how is the sublimity of such an idea augmented when we consider, that this immense body is revolving round its axis at the rate of twenty-eight thousand miles in an hour, and is flying, at the same time, through the regions of space, twenty-nine thousand miles every hour, carrying along with it four moons, each of them larger than the earth, during its whole course round the centre of its motion! And if this planet, which appears only like a luminous *speck* on the nocturnal sky, presents such an august idea, when its magnitude and motion are investigated, what an astonishing idea is presented to the mind when it contemplates the size and splendor of the sun,—a body which would contain within its bowels nine hundred globes larger than Jupiter, and thirteen hundred thousand globes of the bulk of the earth,—which darts its rays in a few moments to the remotest bounds of the planetary system, producing light and colour, and life and vegetation throughout surrounding worlds! And how must our astonishment be still increased, when we consider the *number* of such globes which exist throughout the universe; that within the range of our telescopes more than eighty millions of globes, similar to the sun in size and in splendor, are arranged at immeasureable distances from each other, diffusing their radiance through the immensity of space, and enlivening surrounding worlds with their benign influence, besides the innumerable multitudes which, our reason tells us, must exist beyond all that is visible to the eyes of mortals!

But the *motions*, no less than the magnitudes, of such bodies present ideas of sublimity. That a globe* as large as the earth should fly through the celestial regions with a velocity of seventy-six thousand miles an hour,—that another globe† should move at the rate of one thousand seven hundred and fifty miles in a minute, and a hundred and five thousand miles an hour,—that even Saturn, with all his assemblage of rings and moons, should be carried along his course with a velocity of twenty-two thousand miles an hour,—that some of the comets, when near the sun, should fly with the amazing velocity of eight hundred thousand miles an hour,—that, in all probability, the sun himself, and all his attending planets, besides their own proper motions, are carried around some distant centre at the rate of more than sixty thousand miles every hour; and that thousands and millions of systems are moving in the same rapid manner. are facts so astonishing, and so far exceeding every thing we behold around us on the surface of the earth, that the imagination is overpowered and confounded at the idea of the astonishing forces which are in operation throughout the universe, and of the power and energy by which they are produced; and every rational being feels a sublime pleasure in the contemplation of such objects which is altogether unknown to the ignorant mind.

The vast and *immeasurable spaces* which intervene between the great bodies of the universe likewise convey august and sublime conceptions. Between the earth and the sun there intervenes a space so vast, that a cannon-ball, flying with the velocity of five hundred miles an hour, would not reach that luminary in twenty years; and a mail-coach, moving at its utmost speed, would not arrive at its surface in less than twelve hundred years; and, were it to proceed from the sun towards the planet Herschel, it would not arrive at that body till after the lapse of *twenty-two thousand years*. And yet the sun, at that immense distance, exerts his attractive energy, retains that huge planet in its orbit, and dispenses light and colour, life and animation, over every part of its surface. But all such spaces, vast as at first sight they appear, dwindle as it were into a span, when compared with those immeasurable spaces which are interposed between us and the regions of the stars. Between the earth and the nearest fixed star a space intervenes so vast and uncomprehensible, that a ball flying with the velocity above mentioned, would not pass through it in four million and five hundred thousand years; and as there are stars, visible through telescopes, at least a hundred times farther distant from our globe, it would require such a body four hundred millions of years, or a period 67,000 times greater than that which has elapsed since the Mosaic creation, before it could arrive at those distant regions of immensity.

The *grand and noble designs* for which the great bodies to which I have adverted are intended, suggest likewise a variety of interesting and sublime reflections. These designs undoubtedly are, to display the ineffable glories of the Eternal Mind,—to demonstrate the immensity, omnipotence, and wisdom of Him who formed the universe,—and to serve as so many worlds for the residence of incalculable numbers of intelligent beings of every order. And what an immense variety of interesting objects is presented to the mind when its views are directed to the numerous orders and gradations of intelligence that may people the universe,—the magnificent scenes that may be displayed in every world,—their moral economy, and the important transactions that may have taken place in their history under the arrangements of the Divine government!

Such are some of the scenes of grandeur which science unfolds to every enlightened mind. The contemplation of such objects has an evident tendency to enlarge the capacity of the soul, to raise the affections above mean and grovelling pursuits, to give man a more impressive idea of the *dignity* of his rational and immortal nature, and of the attributes of that Almighty Being by whom he is upheld, and to make him *rejoice* in the possession of faculties capable of being exercised on scenes and objects so magnificent and sublime.—*Dick on Knowledge.*

* The planet Venus. † The planet Mercury.

MR. HAWKINS' REMARKS ON THE ADVANTAGES OF SCIENCE IN HUSBANDRY.—*Continued from last No.*

ACCOUNTS.

In a business embracing so many particulars as farming, it is essential to be able to distinguish the profit and loss upon each. Nothing is more easy or more common than for a man who keeps no accounts, to continue for a series of years, to lose money upon some particular department without knowing it, or, which is almost as bad, to employ his time and capital in less profitable speculations, when he might have applied them to such as were more so. A farmer grows many sorts of crops, and keeps several species of animals,—breeding some and buying others, and uses many kinds of manure. Assuming that he has a general profit of ten per cent at the year's end, how is he to tell whether all the branches of his business have contributed rateably to this result—how, I say, is he to tell this without accounts? The cost of one acre of corn, for example, is by no means self-evident; it is "compounded of many simples, extracted from many objects,"—rent, tithe, taxes, seed and tillage—horses' keep and man's keep—rates for the poor—the church and the highways, and so with every other crop. Suppose now, that in the case of oats, all the items of expenditure accurately set down, shall amount to £5. 15s. annually, and that the crop shall sell for £5. 10s. Upon forty acres, here would be a loss of £10 a year;

but without setting down the several items which compose the cost, and adding them together, how is a man to tell within 5s what his acre of oats cost him? He may know that his acre cost him *about* £5 or £6, but in this *about* is the very *essence* of the mischief. About £5 or £6 may mean either £5 or £6; now if the selling price were £5, 10s. the former supposition would give a profit, and the latter a loss, of £20 a year; and thus any man may, and multitudes do, continue to the end of their lives carrying on branches of business by which they lose money unconsciously. The observations apply to manures brought on a farm. Price, carriage, labor, &c. all reckoned, bone dust may be 5s. an acre dearer or cheaper than stable dung; but without counting up the cost of each item that forms the price, a man may be ignorant of this difference, and he may lose 5s. on an acre. It is by a few shillings gained here and saved there, that a farmer makes his profit. It is no exaggerated estimate to suppose, that these petty items may often make a difference of ten per cent at the year's end, and that so, one man may make a living on the same farm, where another would fail. A knowledge of these details, therefore, is useful, and is to be acquired by a system of accounts. Nearly allied to, if not identical with, accounts, is a facility at all the common operations of arithmetic, and the storing in the mind of certain arithmetical results, which may serve as the basis of future calculations. The multiplication table is a familiar example of the vast importance of this prepared and portable knowledge. The commonest operations of arithmetic could scarcely be carried on without the intuitive readiness with which the product of any two of the numbers under twelve have been made to occur to the mind; but the principle is capable of an application much wider than it has received. The proportions existing between the numerical parts into which the year, the acre, the pound sterling, and the ton weight are divided, might be impressed on the mind, and, as it were, *burnt in* by continued repetition; as, for example, the weight of an acre of turnips, is a fact which it is desirable to know, and which is ascertained in five minutes, if we bear in mind, that, for every pound on the square yard, there are 2 tons, 3 cwt. 24 lbs. on the acre; and we should, in a similar manner, be able to tell without effort, what breadth of turnips would keep a sheep or a cow for a year. The number of inches in a square or cubic yard, and of yards in an acre; the number of pounds in a ton, and the proportion existing between the days in the year, and the common subdivisions of our measures of weight, capacity, superfices and value, suggest themselves as instances. A number of these facts and relations being well impressed on the recollection of boys at school, they would come in afterlife to the calculations necessary to establish knowledge, instead of guesses respecting the affairs of their farms, so well prepared as to make that occur intuitively and without labor, which men, not so prepared, could only come at with much labor, or perhaps not at all. There is scarcely anything easier than the use of logarithms, but we are certainly not all qualified to have invented them.

ADVICE TO A YOUNG TRADESMAN.

BY DR. FRANKLIN.

Remember that *time* is money. He that can earn ten shillings a day by his labor, and goes abroad, or sits idle half of that day, though he spends but sixpence during his diversion or idleness, ought not to reckon *that* the only expense; he has really spent, or rather thrown away, five shillings besides.

Remember that *credit* is money. If a man lets his money lie in my hands after it is due, he gives me the interest, or so much as I can make of it during that time. This amounts to a considerable sum where a man has good and large credit, and makes good use of it.

Remember that money is of a prolific generating nature. Money can beget money, and its offspring can beget more, and so on. Five shillings turned is six; turned again it is seven and threepence: and so on till it becomes a hundred pounds. The more there is of it, the more it produces every turning, so that the profits rise quicker and quicker. He that kills a breeding sow, destroys all her offspring to the thousandth generation. He that murders a crown, destroys all that it might have produced, even scores of pounds.

Remember that six pounds a year is but a groat a day. For this little sum (which may be daily wasted either in time or expense, unperceived) a man of credit may, on his own security, have the constant possession and use of a hundred pounds. So much in stock, briskly turned by an industrious man, produces great advantage.

Remember this saying; "The good paymaster is lord of another man's purse." He that is known to pay punctually and exactly to the time he promises, may at any time, and on any occasion, raise all the money his friends can spare. This is sometimes of great use. After industry and frugality, nothing contributes more to the raising of a young man in the world, than punctuality and justice in all his dealings: therefore never keep borrowed money an hour beyond the time you promised, lest a disappointment shut up your friend's purse forever.

The most trifling actions that affect a man's credit are to be regarded. The sound of your hammer at five in the morning, or nine at night, heard by a creditor, makes him easy six months longer; but if he sees you at a billiard table, or hears your voice at a tavern, when you should be at work, he sends for his money the next day; demands it before he can receive it in a lump.

It shows, besides, that you are mindful of what you owe: it makes you appear a careful as well as an honest man, and that still increases your credit.

Beware of thinking all your own that you possess, and of living accordingly. It is a mistake that many people who have credit fall into. To prevent this, keep an exact account, for some time, both of your expenses and your income. If you take the pains at first to mention particulars, it will have this good effect; you will discover how wonderfully small trifling expenses mount up to large sums, and will discern what might have been, and may for the future be saved, without occasioning any great inconvenience.

In short, the way to wealth, if you desire it, is as plain as the way to market. It depends chiefly on two words, *industry* and *frugality*; that is, waste neither *time* nor *money*, but make the best use of both. Without industry and frugality nothing will do, and with them everything. He that gets all he can honestly, and saves all he gets, (necessary expenses excepted) will certainly become *rich*—if He, who governs the world, to whom all should look for a blessing on their honest endeavors, doth not in his wise providence otherwise determine.

THE CULTIVATOR—DEC. 1834.

TO IMPROVE THE SOIL AND THE MIND.

THE MANAGEMENT OF CALVES,

Is a matter of interest with the dairy farmer. The object is to fatten or rear calves in a healthful condition with the least possible expense to the dairy. We find in an article upon this subject, in the Edinburgh Quarterly Journal of Agriculture, written by Mr. Aiton, some remarks which are new to us, and which, we believe, will be useful to the dairy patrons of the Cultivator. In fattening calves for the butcher, the dairymen of Strathaven, whose practice Mr. A. describes, consider it most profitable to feed them from four to six weeks, at which age they are made to bring from £3 to £4. ($13 to $17.) Beyond this age they make but a bad return for their feed, and under it they are justly considered unfit for the market. The following is given as the Strathaven mode of feeding, and furnishes, also, the reasons for the practice.

"The calves are fed on milk only, with seldom any admixture; and they are not permitted to suck their dams, but are taught to drink their milk from a dish. As arguments are advanced for even the worst of practices, those who allow their calves to suck, say, that by so doing, a much greater portion of saliva is secreted, and carried with the milk into the stomach of the calf, where it promotes digestion, and accelerates the growth and fattening of the young animal. But although saliva is necessary to digestion, it can be drawn forth by placing an artificial teat in the mouth of the calf while feeding, and preventing the animal from drinking its milk too hastily, or giving it too cold. In the dairy districts of Scotland, the dairy-maid puts one of her fingers into the calves' mouth when they are feeding, and this, or any thing similar, serves the same purpose as the natural teat, in promoting the necessary secretion of the saliva. A piece of clean leather, about three inches long, and fixed to the bottom of the dish, will, when the milk is given slowly, so that the saliva may be drawn from the glands of the calf, and conveyed to the stomach with the milk, answer every purpose that sucking can serve, and still more saliva may be conveyed to the stomach of the calves. When they are not feeding, a lump of chalk is often laid within their reach, by licking which they are induced to swallow much saliva that would otherwise drop from their mouth

and be lost. Calves frequently chew or suck any thing that is within their reach, not for food, but to help them swallow saliva, and on that account something like a teat should be placed near them, that by sucking it they may promote the secretion of saliva, and convey it to their stomach.

"But though sucking the dam may be favorable to the calf, yet it seriously injures the cow. The calf cannot, when young, consume all the milk of a good cow, and she becomes so fond of her calf that she will not yield her milk to the dairy-maid; and unless the cow's udder is completely emptied of milk every time she is milked, the lactic secretion is gradually diminished, and the cow will ultimately run dry on that account; but when the milk is drawn from the cows and given by hand to the calves, every thing can be regularly corrected to the advantage of the cow, the calf, and the owner of both. And when calves are reared for stock, various substitutes for milk can be gradually introduced, and the milk slowly withdrawn, without injuring the stomach of the calf by a too sudden change of food. And when calves are to be fed, the milk of two cows can be given them by hand-feeding, while cows will suckle none but their own calves.

"The whole secret of fattening calves for veal is to give them, after they are three or four weeks old, an abundance of milk, keep plenty of dry litter in their stalls, let them have the benefit of good air, moderate warmth, and be nearly in the dark, as they hurt themselves with sportiveness when exposed to too much light. In Holland, the best feeders keep their calves in pens or coops, in which they can stand or lie at pleasure, but cannot turn themselves round. I am not sure that such rigid confinement is beneficial. It is necessary, however, to keep fat calves in places where they have but little light. They require to be fed twice every twenty-four hours.

"If a calf becomes *costive*, a small portion of bacon or mutton broth will give them ease; and if they begin to *purge*, a small quantity of rennet, used in coagulating milk, will cure that disease. The Scotch calves are never bled, nor infusions of linseed, oil-cake, or any other food given them, but pure milk from the cow."

SCOTCH CATTLE FAIRS.

These have been established in many parts of Scotland, and are often held two, three and four times a year, at stated periods. At these fairs, immense numbers of cattle, sheep and horses are bought and sold, and indeed they constitute, almost exclusively, the places of sale and barter for live stock. The advantages of these fairs are many and important. They are the place of resort of all who wish to buy and to sell; and they afford to the farmers the best opportunity of becoming acquainted with the improvements in live stock, of appreciating the advantages of the superior kinds, and of acquiring a knowledge in the arts of breeding and fattening. We quote from an account of these fairs, the number of cattle and sheep which are brought to some of them, in order to show to the readers of the Cultivator the immense amount of business transacted at them; for it must be understood, that actual sales take place of most of the cattle mentioned.

Alnwick fair is held twice a year, in May and July. At the first, 3,000 cattle are generally brought, and at the latter 700 or 800, mostly short horns. One-half of these are fat animals, the remainder of various descriptions. The fat animals are bought by butchers for the large towns, and the others by feeders, drovers and dairymen.

At Whitsunbank fair, from 1,000 to 1,200 cattle are sold, mostly short horns; and from 12,000 to 20,000 sheep, principally Leicesters. Fat wethers sometimes reach 45s. a piece, equal to $10.

At St. Ninian's fair, from 700 to 800 cattle, principally short-horns, are sold, and from 12,000 to 20,000 sheep. The best Leicester rams sell as high as £10 to £15 each, and ewes from 30s. to 55s. The reader will bear in mind that a pound sterling is equal to $4.44.

At Woln fair, the sales are equal to the preceding.

At Dunse fairs, nearly 4,000 cattle are sold annually, and 7 to 8,000 sheep, &c.

There are sixteen other places enumerated in the Quarterly Journal, at which similar fairs are held in Scotland, and at which the sales are probably equal to those we have quoted. What we have detailed will serve to convey an idea of the immense business transacted, and of the great benefits resulting from these fairs. We had hoped, and still hope, to see regular cattle fairs established in some of our towns, as affording the most efficient means of improving our cattle husbandry. The exertions of a few spirited individuals, sustained by perseverance, cannot fail in establishing and giving confidence in such fairs among us.

ECONOMY OF FUEL.

We have examined, with interest, a small work, detailing "*Experiments to determine the comparative quantity of heat evolved in the combustion of the principal varieties of wood and coal, used in the United States, for fuel; and also to determine the comparative quantity of heat lost by the ordinary apparatus made use of for their combustion*—By Marcus Bull.

The experiments seem to have been made with great care and accuracy, and the results afford matter of interest to every householder.

Mr. Bull has computed the cost of fuel consumed in Philadelphia, in a given year, to be $80,043, which being divided among the population, gives $7.04 as the average cost of fuel to each inhabitant, supposing the consumption to be equal. Adopting this estimate as a fair average for the population within ten miles of tide water, in the Atlantic states, from Maine to Georgia, it gives an aggregate of twenty-one millions of dollars as the annual cost of fuel for this portion of population, which is assumed to amount to three millions of souls. Estimating the cost of fuel to the remaining eight millions and a half of our population at half the above price, or $3.50 to each individual, he gives us an aggregate of about fifty-one millions of dollars as the total annual expense of fuel, for every purpose in the United States.

The economy of fuel is to be studied—1, in the kind to be selected for use; 2, in its quality and preparation for use; and 3, in the choice of the apparatus in which it is to be used.

In regard to wood.—The quantity of heat evolved by a cubic foot of the several kinds, when in a perfectly dry state, is very nearly in the ratio of their specific gravity, or relative weight; as for example, the specific gravity of shell-bark hickory being 1.000, a cord weighs 4,469 lbs.; by the same scale, the specific gravity of white pine is .476, and the cord weighs only 1,868 lbs. The quantity of heat evolved by a pound of white pine is as great as that evolved by a pound of hickory. The difference in value arises from the great disparity in weight—the hickory weighing as 22, and the pine as 9—and their relative value being hickory 100, white pine 42—or the first being considerably more than twice as valuable as the latter. The table which we shall append will exhibit the relative value of the different kinds of fuel in common use.

Charcoal forms a considerable item of fuel; and the facts which Mr. Bull has given us upon this subject will be found to be new and interesting. The value of charcoal, like that of wood, is principally to be determined by its weight—a pound from one kind of wood affording about as much heat as a pound from another kind. The quantity, or rather weight, of charcoal, afforded by the different kinds of wood, is nearly in proportion to the relative weight of the wood. Thus hickory produces 26.22, the specific gravity of the dry coal being .625; while the white pine produces 24.35, and the specific gravity of the dry coal being only .298. Thus, whether burnt in the form of wood or of charcoal, a cord of hickory affords more than twice the heat that is found in a cord of white pine. The value of charcoal, however, depends much upon the manner in which it is prepared. The more completely the atmospheric air is excluded from the wood, while under the process of being charred, and the more heat that is given to it, the *heavier*, the *harder*, and the *better* will be the product. The best charcoal will be found of a slate colour on its surface, dense, sonorous and brittle; while inferior qualities approach to a jet black, and are soft and powdry, upon the exterior. To obtain the best quality, Mr. Bull recommends that the wood be piled in a single tier, that charcoal dust be interposed between the wood, that the pile be covered with clay, and then a layer of sand, to close the cracks which the fire may cause in the clay, and that the fire be communicated at the exterior base, and in the centre and from the top. An intelligent collier, who partially adopted Mr. Bull's recommendation, gained by it 10 per cent in quantity by measure; and Mr. B. found the coal nearly 20 per cent heavier than usual. If these facts are correct, and we have no reason to doubt them, it would be an excellent police regulation in our towns, to have charcoal sold by the weight, instead of by measure, and would ultimately be beneficial to the seller as well as to the buyer.

The loss in weight which wood undergoes in drying, and the moisture which it absorbs, by exposure, after it has become dry, are mat-

ters of considerable interest to the farmer and the consumer. Hickory wood cut green, and made absolutely dry, experienced a diminution in its weight of 37½ per cent, white oak lost 41 per cent, and soft maple 48 per cent, or very near one-half. Both wood and charcoal, after being made perfectly dry, absorbed in twelve months, under cover, from 8 to 12 per cent of moisture.

If we assume, says Mr. B. the mean quantity of moisture in the woods, when green, at 42 per cent, the great disadvantage of attempting to burn wood in this state, [or to transport it a distance,] must be obvious, as in every 100 lbs. of this compound of wood and water, 42 pounds of aqueous matter must be expelled from the wood, [or transported;] and as the capacity of water for absorbing heat is as 4 to 1, when compared with air, and probably greater during its conversion into vapor, which must be effected before it can escape, the loss of heat must consequently be great.

GENERAL TABLE.

Common names of woods and coals.	Specific gravity of dry wood.	Avoirdupois lbs. of dry wood in a cord.	Product of charcoal from 100 parts of dry wood by w't.	Specific gravities of dry coal.	Pounds of dry coal in one bushel.	Pounds of charcoal from one cord dry wood.	Bushels of charcoal from one cord dry wood.	Time 10° of heat were maintained in the room by the combustion of 1 lb. of each article. H. M.	Value of specified quantities of each article, compared with shell bark hickory as the standard. Cords.
White Ash,	.772	3,450	25.74	.547	28.78	888	31	6 40	77
White Beach,	.724	3,236	19.62	.518	27.26	635	23	6	65
Black Birch,	.697	3,115	19.40	.428	22.52	604	27	6	63
Chesnut,	.522	2,333	25.29	.379	19.94	590	30	6 40	52
White Elm,	.580	2,592	24.85	.357	18.79	644	34	6 40	58
Shell-Bark Hickory,	1000	4,469	26.22	.625	32.89	1,172	36	6 40	100
Pig Nut Hickory,	.949	4,241	25.22	.637	33.52	1,070	32	6 40	95
Red Heart Hickory,	.829	3,705	22.90	.509	26.78	848	32	6 30	81
Horn Beam, (Iron Wood,)	.720	3,218	19.	.455	23.94	611	25		65
Hard Maple,	.644	2,878	21.43	.431	22.68	617	27	6 10	60
Soft Maple,	.597	2,668	20.64	.370	19.47	551	28	6	54
White Oak,	.855	3,821	21.62	.401	21.10	826	39	6 20	81
Shell-Bark White Oak,	.775	3,464	21.50	.437	22.99	745	32	6 20	74
Pin Oak,	.747	3,339	22.22	.436	22.94	742	32	6 20	71
Red Oak,	.728	3,254	22.43	.400	21.05	630	30	6	69
Rock Chesnut Oak,	.678	3,030	20.86	.436	22.94	632	28	6 40	61
Pitch Pine,	.426	1,904	26.76	.298	15.68	510	33	6 40	43
White Pine,	.418	1,868	24.35	.293	15.42	455	30	6 40	42
Lombardy Poplar,	.397	1,774	25.	.245	12.89	444	34	6 40	40

The above is merely an abstract of Mr. Bull's table, comprising merely the woods in most common use among us. The last column exhibits the relative value of a cord, according to the heat which each affords. Thus, if hickory is worth one dollar, pig nut hickory is worth 95 cents, hard maple 60 cents, white oak 81 cents, white pine 42 cents, pitch pine 43 cents, &c.

We will now exhibit, in tabular form, the relative value of coals, by the same standard, merely remarking, that a ton of anthracite coal is considered about equal to a cord of shag bark hickory.

COALS.	Specific gravity of dry coal.	Pounds of dry coal in one bushel.	Time 10 deg. of heat were maintained in the room by the combustion of 1 lb. of each article. H. M.	Value of specified quantities of each article, compared with shell bark hickory as the standard.
Lehigh,	1.494	78.61	13 10	Tons. 99
Lackawana,	1.400	73.67	13 10	99
Rhode-Island,	1.438	75.67	9 30	71
Schuylkill,	1.453	76.46	13 40	103
Susquehanna,	1.373	72.25	13 10	99
Worcester,	2.104	110.71	7 50	59
				100 bushels
Liverpool,	1.240	65.25	10 30	230
Richmond,	1.246	65.56	9 20	205
Hickory charcoal,	.625	32.89	15	166
Maple do	.431	22.68	15	114
Oak do	.401	21.10	15	106
Pine do	.285	15.	15	75
Coke,	.557	29.31	12 50	126

ECONOMY OF BURNING.

Mr. Bulls experiments were made in a sheet iron stove, with 42 feet of two inch pipe, having about 20 elbows. A thermometer placed at the mouth of this pipe indicated the same temperature as another hung against the wall of the room, which showed that all the heat given off by the combustion of the fuel, was retained in the room. On the supposition that 100 lbs. of fuel, consumed in this stove, would maintain a temperature of 60 degrees for 12 hours, he found, that to maintain the like temperature for the same time, by other apparatus, the fuel must be increased as follows:

In the experiment stove it required ..... lbs.	100
In the sheet iron cylinder stove, the interior surface coated with clay lute, with nine elbow joints, and 13½ feet of two inch pipe, ...	105
In a like stove and pipe, with 3 elbow joints, ...	122
In a like stove, and similar pipe and joints, but the pipe placed more vertical than the preceding, ...	128
In a like stove, with 5 feet of pipe and one elbow, ...	149
In a like stove, without clay lute, one elbow, and five feet of four inch pipe, ...	222
In an open Franklin, with one elbow, and five feet of six inch pipe, ...	270
In an open ordinary parlor grate, ...	555
In an open chimney fire-place, ...	1,000

It would seem from these experiments, that nine-tenths of the heat given off by fuel burnt in an ordinary fire-place, are carried off in the draft, without benefitting the room; that nearly one-half is wasted when the fuel is consumed in an open parlor grate; and that lining a stove with fire brick, or clay lute, produces a great economy in fuel.

These experiments afford important suggestions to the housekeeper. Assuming as data, that four cords of dry shell-bark hickory, burnt in a sheet iron cylinder stove, with five feet of pipe and one elbow, will warm an ordinary room during the winter months, it will require to keep up the like temperature, in a similar stove, the following quantities of other materials:

Hickory, as stated,	4	cords,
White oak,	4 3-4	"
Hard maple,	6 2-3	"
Soft maple,	7 1-5	"
Pitch pine,	9 1-7	"
White pine,	9 1-5	"
Anthracite coal,	4	tons.

I. H. J. inquires of us, in the *Maine Farmer*, if the culture of wheat has not declined in the old counties of this state, and the cause of this declension. It has declined materially; and there are several reasons for it. One cause is, that we cannot compete in its culture with the great west, on account of the latter growing double the crop, and with less labor and expense in its production, than we do. The west is emphatically a wheat soil, a secondary formation,

abounding in lime and animal matters, the specific food of that grain. Ours is but partially a wheat soil, being principally transition formation, and containing less, naturally, of the specific food of wheat. Another reason is, that our lands have been injudiciously cropped and impoverished. They have been made to carry wheat too often. A better system of management is obtaining among us, and the quality of our wheat is rather improving with good farmers, though the inducement for raising it is lessened by the facilities of the west for competing with us in this great staple. The valleys of the Hudson and Mohawk, formerly great wheat districts, do not at present, we think, grow wheat enough for the subsistence of their population, throwing out of the calculation the cities of New-York and Albany.

I. H. J. who appears to be a practical farmer, may render us a favor, and possibly the community a service, by one or two experiments, no matter upon how small a scale. We have intimated that lime and animal matters are essential to the successful growth of wheat—that they constitute its specific food. These, it is believed, do not naturally abound in primitive formations, particularly in old fields. We wish to have the correctness of our opinions tested, and our request is, that they may be artificially applied, separate and jointly, on different parcels of ground, to be sown with wheat, and that the result may be accurately noted and published. Crushed bones would supply both materials; or, if the lime is applied separately, slaughter-house manure, the urine of animals, soap-boilers' waste, comb-makers' shavings, fish, &c. would either of them supply the other material. It is proper to caution against applying any of these materials in excess—as a small quantity will suffice, and the result will be more satisfactory if the fertilizing materials are applied to the crop which precedes the wheat.

SPADE HUSBANDRY.

We have no expectation of ever seeing spade husbandry adopted in our country, on any thing like an extensive scale. The price of manual labor forbids it. Yet we cannot refrain from noticing an interesting article upon this subject in the September No. of the Edinburgh Quarterly Journal of Agriculture. A premium of £100 was given to Mr. Archibald Scott, "for the best plan of furnishing employment for the surplus laborers of England." Mr. Scott's *plan* consists in trenching with a spade the ground intended for its grain crops, and thus substituting manual labor for cattle power in cultivating his fields. The plan is not merely theoretical, but has been reduced to extensive practice, and found to be highly profitable. Mr. Scott pays his laborers 1s. 6d. per day, equal to about 33 cents, they boarding themselves. At this price of labor, the trenching costs him £4.10 (about $20) per Scotch acre. The soil is 18 inches, the top of which is thrown to the bottom, and the whole well pulverized. The first experiment was made in 1831, upon 13 acres of summer fallow. The profit per acre upon the trenched ground, was £3.18s. 9d. while that upon adjoining land, ploughed as usual, was only 9s. 6d. It is to be observed that the ploughings were repeated six times, which must unnecessarily have swelled the expense. In 1832, Mr. Scott trenched 44 acres with like success. His account of expense and profit stands thus:

By average of 44 bushels per acre, at 7s.....				£15	8 0
To rent of land per acre,.....	£2	10	0		
Expense of trenching,.....	4	0	0		
Seed, ...	1	1	0		
Cutting, threshing and marketing,....	1	10	0		
Profit,.....	9	7	0		
	£15	8	0	£15	8 0

Thus leaving a nett profit per acre, of about $28. In 1833, Mr. Scott trenched about 100 acres; and such was the apparent advantage of his method, that his example was being extensively followed in East-Lothian. The Scotch contains about a quarter more than the English acre, or about 200 rods; and to trench this, it requires, it seems, 60 days' labor.

The effect of trenching is to clean the ground, and to induce increased fertility, by turning the exhausted surface under, and effecting a complete pulverization. In gardens and other old cultivated grounds, trenching is sometimes resorted to even with us, and its advantages are found to repay the labor. The data furnished by Mr. Scott's experiments are worth preserving.

Gypsum.—Raspail has decided, as the result of a series of experiments, that "it is not the leaves of the leguminous plants that absorb the gypsum which is dusted over them, but the roots, when the dew or rain has washed it into the soil; and hence the advantage which has been found of applying this powder a little before the dew comes on." It was the practice of John Taylor, conspicuously known as the author of Arrator, and one of the best practical farmers in Virginia, to sow his plaster, for tillage crops, before the last ploughing, that it might be buried in the soil, where the roots of plants required it. In applying it to grass lands, he recommended, if our memory serves us, that it be applied early, that the spring rains might convey it to the roots. We have in the pamphlet of Judge Peters, upon the application of gypsum, another corroboration of the correctness of M. Raspail's conclusions: In many instances there narrated, where the gypsum was sown at the commencement of a drought, or late in the season, it produced no apparent benefit that year. It would be useful if farmers would satisfy themselves upon this head, by sowing a part of a field early and a part late, a part before the last ploughing, and a part upon the growing crop. So far as our opinions have been formed from practice, they are in favor of sowing on grass in April, and for tilled crops before the last ploughing.

HUMUS, HUMIN AND HUMIC ACID.

These are terms of recent introduction into the vocabulary of agricultural writers. There has been much controversy as to the nature and properties of this substance, or these substances, for it is not agreed yet whether they are identical or distinct. According to some, *humin* is composed of carbon, or *charcoal*, and hydrogen; and *humic acid* of carbon and oxygen.* For all practical purposes, it is sufficient to know, that these novel terms mean animal and vegetable matters, upon which fermentation has exhausted its powers, and dispelled their gaseous portions, and that it is the identical substance which imparts fertility to our soils. "It is," says Mr. Tower, in the Quarterly Journal, "in point of fact, neither more nor less than the substance which constitutes the black reduced mass of an old fermented dung-hill." Its origin and its properties are summarily expressed by Van Thaer, the principal of the great Prussian agricultural school, in the following concise quotation.

"Besides the four essential elements of its composition, (carbon, oxygen, hydrogen and nitrogen,) it also contains other substances in smaller quantities, viz. phosphoric and sulphuric acids, combined with some base, and also earths and salts. Humus is the product of some living matter, and the source of it. It affords food to organization. Without it, nothing material can have life. The greater the number of living creatures, the more humus is formed; and the more the humus, the greater the supply of nourishment and life. Every organic being in life adds to itself the raw materials of nature, and forms humus, which increases as men, animals, and plants increase in any portion of the earth. It is diminished by the process of vegetation, and wasted by being carried into the ocean by the waters, or it is carried into the atmosphere by the agency of the oxygen of the air, which converts it into gaseous matter."—See Thaer *Grundsatze, du Rationellen Landwerthschaft*, 4 vols. 4to.

Marl.—We have received for analysis, a specimen of marl found in Granville. It proves to be of little value for agricultural purposes. It has too much clay, and too little of carbonate of lime in its composition. The rule in England is, that unless marl contains more than thirty per cent of carbonate of lime, it is of no value to the farmer. "Of all the modes of trial," says Parke, "the one best suited to the farmer, is to observe how much carbonic acid gas the marl gives out, and this he will learn by dissolving a little of it in diluted muriatic acid, and observing what portion of its weight is lost by the escape of the air. Thus, if an ounce loses only from forty to forty-four grains in weight, he may conclude that the ounce contained only 100 grains of carbonate of lime"—and consequently is not applicable in those cases where the soil requires lime. The marl should be completely dried and pulverized previous to trial, and both it and the acid should be accurately weighed before and after the test, in order to know the amount of gas which escapes, and which amounts from 40 to 44 in every 100 parts of carbonate of lime. It is to be borne in mind, however, that clay improves the mechanical texture

* Raspail asserts, that these are "simple alterations, either spontaneous or artificial, of the woody textures,"—[*New System of Organic Chemistry,*] preparatory to their entering into new organizations.

of sands as well as limes, and tends to increase their productiveness. In this point of view, therefore, the Granville marl, if transportation is not too expensive, may be applied to sandy porous soils with permanent advantage. On light sands, clay is of as much value as lime. Neither lime nor clay furnish food to plants, yet the presence of both is necessary to adapt a soil to healthy, vigorous vegetation.

CORRESPONDENCE.

FROM MY MEMORANDUM BOOK.

I send you, Messrs. Editors, a memorandum of the produce of thirty-six and a half acres of land, the past season, in grain and grass, not on account of any thing worthy of notice in the result, but that others may profit by my *errors* as well as by my wisdom. The soil is a sandy loam, and no part received but one ploughing for a crop.

17	acres	produced	53	tons of	hay,
4	"	"	74	bushels	rye,
1	acre	"	2	"	wheat,
1½	acres	"	574	"	ruta baga,
4	"	"	776	"	potatoes,
5	"	"	360	"	sound* corn,
4	"	"	87	"	barley.
36½	acres.				

REMARKS ON THE CULTURE.

Hay.—The crop was impaired by the frost of last winter having killed much of the clover, particularly on about three acres laid down last year. Two acres were in a reclaimed swamp, which were cropped with potatoes in 1833. The wet spring not permitting the ground to be ploughed in due time, and the grass, which sprung up spontaneously, promising something of a crop, it was suffered to remain. The product was but *so so*. Three and a half acres were a ley of four or five years, which ought to have been broken up before; as grass, with me, generally diminishes after the third year. The residue bore a heavy crop, and averaged, by estimation, three tons an acre.

Rye.—As it is my maxim to sow this grain either very early or very late, I was obliged to sow late, in consequence of the ground having been encumbered with a potatoe crop. The product was a fair crop, though I think that if three or four pecks more of seed had been sown on the acre, there would have been a corresponding increase in the product. The grain was good, but thin, the late sown not tillering like that which is sown early.

Barley.—One-half of the barley ground was over-manured, and the grain was prostrated before it got into blossom. The product of this part was of course trifling. It should have had no manure, as it followed a crop of ruta baga well dunged. Besides, it does not answer to have barley ground too rich, or to apply to this crop long manure.

Wheat.—This was sown in February, on ground ploughed in the fall. It promised tolerably well, until it was attacked by the wheat insect, which virtually destroyed the crop. Scarcely a head contained more than three or four kernels, and in some cells, while the grain was standing, I found five and six insects.

Ruta Baga.—This was the poorest crop I ever raised of the kind, and the failure is not attributable to any error of mine, but to the dry summer. It was sown upon an old grass ley, previously plastered, and dunged, ploughed and harrowed just previous to drilling in the seed. The soil was very dry when worked, and there was not sufficient rain afterwards to bring on a decomposition of either the manure or the sod. Comparatively but few of the seeds grew, and the rows were not half filled with plants. In a favorable season the product would have been more than double.

Potatoes.—Two acres were on a grass ley, well dunged with long manure, and gave a good crop for the season, of more than 300 bushels the acre. This crop received two ordinary dressings, but after harvest I caused all the weeds to be pulled up, and carried to my cow-yard, which, I am confident, added very greatly to the potato crop. One acre was planted on ground habitually wet, and which had been underdrained late the preceding fall. The ground was but imperfectly ploughed, the crop was badly tended, and the product was hardly worth gathering, even in this season of scarcity. The fourth acre was principally on ground where barley had been seriously injured by the frost of the 15th May; it was planted late, with refuse seed. The ground was very dry, and from late planting, bad seed, and a very dry season, the product did not exceed 100 bushels. My practice is not to earth potatoes after the tubers have began to form, as earthing them is apt to cause a new set of stolens to start near the surface, which rob the elder ones of their food, and produce potatoes only of a diminutive size. Yet weeds ought to be carefully extirpated, as they not only impoverish the soil, but shade the ground, to the great prejudice of the crop. The labor of extirpating weeds is amply repaid in the increased product. I think I am warranted in saying, that a clover ley, and long manure, the latter well spread and ploughed under, are admirably adapted both to the corn and potato crop.

Corn.—This and the unproductive acre of potatoes, were grown in a field abouuding in springs, and heretofore habitually wet, but which was underdrained the preceding autumn. A part of the ground had been in pasture, and a part under tillage, and the whole was well manured. The hills were planted three by two and a half feet apart, and there remained after the first dressing, four spears in almost every hill. The corn was dressed with the harrow and cultivator, and twice hoed, though but very slightly hilled. Four-fifths gave an uncommon fair crop. Sixty-three selected ears gave a half bushel of shelled grain, averaging more than half a pint each. The other fifth was killed by kindness, or rather from want of personal attention. Having two loads of horn shavings and crushed bones, I directed them to be spread on *two* acres: but my men, being unacquainted with these materials, and not appreciating their strength as a manure, thought to do me a kindness, and applied the whole to *one* acre. The consequence was, the stalks were too luxuriant and tender, and the wind prostrated them flat to the ground ere the grain was half grown, and but very little of the corn was fit for the crib.

At present prices, the products I have enumerated are worth about $1,300, and average about $36 to the acre.

The errors in my practice, against which I would guard the reader, are:—

1. In sparing grass lands from the plough after the cultivated grasses have most run out, and after the product has materially diminished.
2. In sowing *late* rye too thin.
3. Applying manure to a barley crop, the soil of which was already rich enough—particularly long manure.
4. In planting potatoes too late, and with bad seed.
5. In the excessive and wasteful application of bone and horn manure. And finally,
6. In not superintending personally ALL the operations of the farm. We may hire men to *work*; but it is difficult, as my friend Delavan observes, to hire men to *think correctly*.

By way of postscript I will remark, that I had made, in 1833, in the six acre field in which I grew my corn, about 200 rods of brush and straw underdrains, which cost me about $20, and that I think I am fully remunerated for this outlay in the *increased* product of the field in the past season. B. J.

New-Paltz, Nov. 3, 1834.

SIR,—I have a very valuable apple tree which had the bark eaten off a few inches above the ground, by mice, in the winter, and I took the following method to save the tree. I took four small twigs from another tree, and engrafted them below the wound, in the manner of side grafting, and loosening the bark above, bent the twigs and slipt them under the bark until they came parallel with the body, then covered them well by banking the dirt above the wound and grafts. I left the earth around one season, then cleared it away, and found two had taken. These have commenced to form new bodies, and the tree, from all appearances, is as thrifty as ever, and the twigs have grown in two years to the bigness of your thumb.

I am, dear sir, your humble servant,

J. BUEL, Esq. ABRAHAM STEEN.

P. S. I have also obtained a few twigs or slips of the real Italian Mulberry; the seed was imported three years ago; these I have inoculated in the common white mulberry stock, and they grow very thrifty indeed. They have very large leaves and are very tender. Some of the largest I have measured, and find them from six to eight inches wide, and from seven to ten inches long. I shall have some fit for sale in a few years. A. S.

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* My *soft* corn and small potatoes, and some pumpkins, have fattened about 2,500 pounds of pork, *finished*, during the last ten day, with *hasty pudding*.

SOUTH DOWN SHEEP.

I was very much gratified, a few days since, on viewing six ewes and a buck of the much esteemed breed of South Down, lately imported, in the ship Hannibal, from the famous flock of Mr. John Ellman, England, by Francis Rotch, Esq. of Butternuts, Otsego co. They were in fine condition, and did not appear to have suffered in the least from the voyage, which is a strong argument in their favor as to hardihood.

The buck is rather larger than they generally are, but of fine form and symmetry—great length, round and deep in body—fine in the head and legs—full and capacious chest—remarkably broad in the loin and heavy in the quarters—and well covered with a close fine fleece of wool.

The ewes are equally beautiful, and show higher breeding than the buck, and of course not so large. Take them together, I saw more to admire, more good points, more style and fashion about them than any others I ever witnessed.

This breed of sheep are justly becoming great favorites in this country. They will, I think, cross well with the Merino or our native sheep, giving them stronger constitutions and a greater aptitude to fatten.

From the transactions of the Pennsylvania Agricultural Society, I have transcribed the following account of this breed of sheep.

"The South Down sheep are much smaller than the Dishly—they are more hardy—their wool is short, equal in quality to that of half-bred Merino—their fleeces are not so heavy—they carry more fat within, and much more flesh without, than either the Dishly, Tunisian, Irish or Teeswater sheep. By their activity and vigor, both of muscle and constitution, they are fitted to encounter every difficulty, as well as to endure the extremes of heat and cold. They occupy, in England, one of the most exposed and least fertile portions of the Island. Their mutton is of the finest kind, and commands the highest price, although, from the properties of the sheep, it can be produced at the least cost.

"I am of opinion," says this writer, "that the South Down sheep are as valuable a stock, if not more so, than any other that have been kept in this country."

"The fleece is close, heavy, and sufficiently fine for general purposes, and a small part fine enough for any purpose to which wool is likely to be applied for many years to come."

From the New-York Farmer and Horticultural Repository, the following description of these sheep is taken.

"*The South Down sheep* are without horns; they have dark or black-grey faces and legs, fine bones, long small necks; are low before, high on the shoulders, and light in the fore quarter: the sides are good and the loin tolerably broad, back bone too high, the thigh full, and twist good. The fleece is very short and fine, weighing from two and a half to three pounds. The average weight of two year old wethers is about eighteen pounds per quarter, the mutton fine in the grain and of an excellent flavor. These sheep have been brought to a high state of improvement by Ellman, of Glynde, and other intelligent breeders. They prevail in Sussex, on very dry chalky downs, producing short fine herbage."

Albany, Nov. 1834. AMATUER.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

I. SOILS.

II. *The Properties of Soils, as determined by Chemical Analysis.*

Having examined the external characters of soils, we might inquire into their properties, as determined by chemical analysis. This, however, is a branch of the extensive subject of agricultural chemistry, into which it would not be consistent with the practical and elementary nature of this work to enter at length. It is merely proposed, therefore, to direct the attention of the student to this part of the science of agriculture, and to make known to him a few results which have been arrived at.

The soil has been said to be a compound of mineral substances, mixed with a portion of vegetable and animal matter.

The vegetable and animal matter of the soil, to which the term mould has been applied, exists either in a state of mixture, or of chemical union with the minerals of the soil.

The mineral matter of the soil forms greatly the larger part of it, and necessarily consists of the same substances which constitute the mountain rocks and mineral masses which are found on the earth, and which form its crust or covering. The hardest rocks break down by degrees, and are decomposed by the influence of air and moisture. Sometimes the decomposed matter remains upon the rocky basis from which it had been derived, and there forms a soil; but more frequently the action of water has mingled together the different mineral masses and strata which are found over all the earth.

The great body of the soil, then, is a mixture of the various mineral substances which are upon the earth, and is resolvable into the same constituent parts. Now, all the rocks and other mineral masses which exist on the surface of the earth, are found to consist of a few bodies, the principal of which are four earths—silica, alumina, lime and magnesia,—and the oxide of iron, soda, and potassa. In like manner, the great mass of the mineral part of the soil is resolvable into silica, alumina, lime, magnesia, the oxide of iron, soda and potassa.

The manner in which this compound body may be conceived to exist is the following: Let it be supposed that the different minerals on the surface of the earth are more or less decomposed, broken, ground down, as it were, and mingled together.

Some are in the form of stones, and are therefore merely species of the different rocks of a country. These form loose stones and gravel, which we see accordingly to be every where mingled with the soil, and to form often a great proportion of it.

A more minute comminution reduces these mineral substances to sand. This is the form in which the largest part of all soils exists, and when it is in a very considerable proportion to the whole, the soil is termed sandy.

When the parts are more comminuted still, and reduced by chemical or mechanical means to powder, the soil appears to be in the state most favorable to vegetation. All our finest soils contain a large comparative proportion of their parts reduced to this state of division; and where none of this finely divided substance, or a small quantity of it only exists, the soil is barren.

Of the substances which form the constituent parts of minerals, the most widely diffused is silica. This earth forms the principal constituent part of all the fossils and mountain rocks of which the crust of the earth is composed. Those in which it exists in large quantity are usually very hard. The sand of the sea-shore is mostly silicious, and silicious sand forms vast deserts in every part of the world.

In quartz, and in felspar, this earth exists nearly pure, and it forms 98 parts in 100 of common flint. It is from its abundance in quartz, a mountain rock of universal diffusion, and in felspar, which is likewise one of the most abundant minerals in nature, that silica is important as forming a principal constituent part of all the loose mineral matter of the surface of the earth, and consequently of all soils.

Quartz is a rock of constant occurrence, and its disintegrated parts have been every where washed into the plains to form an element of the soil. Quartz has been found to consist of silica, alumina, and a small quantity of oxide of iron. Quartz is also an integrant part of sandstone, and other rocks of general diffusion. It enters largely into the composition of granite and other primary rocks. It forms, in short, a part of the rocks in all the series of formations which geologists enumerate; and thus silica is the most universally diffused mineral substance on the surface of the earth, and forms a part, accordingly, of every soil that is known to us.

Alumina, next to silica, is the most generally diffused of the earths. United with silica, it forms a great proportion of all the rocks and mineral masses on the earth. It is accordingly every where found; and forms a part of every soil not wholly barren. Kneaded with water it becomes a ductile paste, and is the substance which chiefly gives their plastic and ductile characters to the soils termed clays.

Silica and alumina, then, forming the largest part of the rocks and minerals which exist upon the surface of the earth, enter the most largely into the composition of soils; and in these they are found to exist, either as grains of sand, or as gravel, or in the form of an impalpable powder.

Lime, the next of the earths, is one which is of wide extension, and performs an important function in the vegetable economy.

In nature this mineral is usually found in combination with acids. Combined with carbonic acid, it constitutes the numerous varieties of marble, limestone and chalk. In this and other combinations, it exists in rocks, in soils, in the waters of the ocean, in plants, and in animals. It forms great rocks and mineral strata; and numerous fossils in combination with silica and alumina.

It is chiefly from the carbonate that the lime used in agriculture is derived. By exposing the carbonate to strong heat, the carbonic acid is driven off, and that which remains is the caustic earth, to which we give the name of quicklime. This substance has a strong affinity for water, which it will absorb from the atmosphere. When the water is applied in quantity, it is absorbed by the lime, with a great evolution of heat; and this is the process of slaking so well known. The lime thus combined with water attracts carbonic acid, and again becomes carbonate of lime; although, in this state of carbonate, it presents external characters entirely different from those which it possessed in its original state of marble, limestone and chalk. But it is in external characters only, and in the lesser degree of cohesion of its parts, that it differs, for otherwise the substances are the same.

By the minute division of its parts by heat, we are enabled to apply lime to the soil in the shape of a finely divided powder, and thus in the best form for improving the texture of the soil. It is from this cause doubtless, as well as those important purposes which it serves as a manure, that this earth is of such importance to the husbandman. Could we apply the earths silica and alumina to the soil in their pure state, or could we reduce them by mechanical or chemical means to powder, we should be able to apply them in a form calculated to improve the texture of the soil.

Lime exists in all soils formed by the decomposition of rocks; but in soils formed wholly by the aggregation of vegetables, as peat, it does not necessarily exist. It improves the quality of all soils, whether they are formed of silica, alumina or vegetable matter.

Silica, and alumina, and lime, forming the principal part of soils, and, where any one of them prevails, giving its character to the soil, it is frequently convenient to distinguish soils, as being Silicious, Aluminous or Calcareous. Where silica prevails, as in the case of many sands, we may call the soil silicious; where clay prevails, we may call the soil aluminous; and where lime exists in quantity, as in the case of chalk, we may call the soil calcareous. Thus, in addition to the less artificial division of the farmer, derived from the texture and external characters of the soil, we may use those derived from its composition.

Magnesia, in various states of combination, exists in nature in considerable quantity. It is generally found in combination with acids, as the carbonic. In mountain rocks and fossils, it exists along with silica, alumina, lime, iron, and other substances. The minerals of which it forms a part, generally feel soft and unctuous. It is the principal constituent of various mountain rocks, as serpentine and chlorite-slate; and thus being an element in many rocks and fossils, it must form a considerable part of soils. Magnesia, however, is less generally diffused than lime, and may perhaps perform a less important function in the economy of vegetation. When it exists in such quantity as to give a character to the soil, we may term the soil Magnesian.

The next substance that exists largely diffused in the mineral kingdom, is oxide of iron.

Iron, as it is the most useful of the metals, so it is generally diffused on the earth. It is derived, for the purposes of the arts, from a series of minerals termed ores of iron. It is found extensively in mountain rocks, and many fossils; and it exists, accordingly, in more or less quantity, in almost every soil. Its precise effects, however, on the productive powers of soils, have not been well determined, some soils, where it exists, being extremely barren, while in some very fertile soils it exists in large quantity. Soils which contain much of iron may be termed Ferruginous.

The alkalies, soda and potassa, are also found in soils, being extensive products of the mineral kingdom. They are found in nature combined with various acids. Muriate of soda, or common salt, one of these combinations, is a widely diffused mineral in soils, a certain quantity of which is probably necessary to the existence of plants, while in excess it is known to be injurious.

Soils, then, consist chiefly of silica, alumina, lime, magnesia, oxide of iron, potassa and soda, together with a portion of organic matter.

From various experiments, it is known, that plants consume, in growing, the decomposing animal and vegetable matter which the soil contains. It is rendered probable also by experiments, that a portion of the earthy matter of the soil—the silica, the alumina, the lime, as well as various saline substances contained in it—is absorbed by the plant, though in minute quantity, as compared to the animal and vegetable matter absorbed.

Further, the medium of supply of the matter of nutrition contained in the soil, may be regarded as water holding in solution the vegetable, animal and other matters which pass into the roots of plants. The soil, then, may be chiefly regarded,

1st. As the instrument for fixing the roots of plants in the ground; and,

2d. As a medium for conveying to them the water holding dissolved the different substances which pass into the plant.

The air may be considered as a vehicle for conveying water to the soil. It is continually charged with aqueous vapor; which partly descends to the earth in rains, and is partly deposited in dews, in the cool of the night. In many countries, it never rains at certain seasons, and the whole moisture is supplied by the dew. In this case, in an especial degree, and in all cases in a certain degree, the power of the earth to absorb moisture from the air, may be regarded as connected with the means of the soil to nourish plants.

All our fertile soils, accordingly, have a power of thus supplying themselves with moisture, and of retaining it for the proper time; while infertile soils either have less of this absorbent power, or retain the fluid absorbed for a shorter time.

Of the different matters which enter into the composition of soils, animal and vegetable substances possess the greatest power of absorbing moisture; and the addition of animal and vegetable substances always increases the fertility of soils.

Of the pure earths, the least absorbent is silica, and it is that also which parts the most readily with its moisture. A soil consisting of too great a proportion of silicious sand is always infertile. It imbibes the aqueous vapor of the atmosphere with slowness, and parts with it quickly. A soil of silicious sand will scarcely be penetrated by the dew of night, and will part with it on the first action of the morning rays of the sun.

While pure silica will imbibe scarce a fourth part of its weight of water, lime will absorb nearly its own weight, and alumina two and a half times its weight. But while the silica will absorb a smaller quantity than alumina or carbonate of lime, it will allow it to evaporate two times more quickly than carbonate of lime equally divided, and five times more quickly than alumina in the same state.* The addition of carbonate of lime or alumina to a soil containing too much silica, never fails to increase its powers of absorption and its fertility.

The order in which the principal substances that enter into the composition of soils, possess an absorbent power, is the following:

1. Animal and vegetable substances.
2. Alumina.
3. Carbonate of lime.
4. Silica.†

It appears, too, that the more perfectly the parts of the soil are comminuted, decomposed and reduced, the greater is the power of absorption which they possess; and that the larger the proportion of the soil is which exists in this minutely divided state, the greater, *cæteris paribus*, is its fertility.

But, although certain earths in their separate state have thus a greater power of absorption than others, it does not follow, that a soil consisting chiefly of that one earth would possess a greater power of absorption than a soil composed of a mixture of earths, even though these earths should in themselves be less absorbent. Thus, a soil consisting chiefly of aluminous earth, though alumina be itself the most absorbent of all earths, taking water up in the greatest quantity when poured upon it, as well as retaining it the longest, would not really be so absorbent as if it were more mixed with other earths. Hence, the stiffer clays are not the soils which absorb water readily from the atmosphere; for, when the weather is dry, such soils become indurated upon the surface, which presents an obstacle to absorption; and thus we find, that in hot weather the vegetation of very stiff clays is almost as soon injured by drought as that of light soils, and much more quickly than that of good loams.

A mixture of silicious sand, then, with a very aluminous soil, although the sand be the less absorbent substance of the two, seems to increase the general power of absorption from the atmosphere; so also does a mixture of lime, and in an eminent degree, of animal and vegetable matter.

It is not, therefore, the prevalence of any one earth that constitutes a soil well fitted to absorb humidity. A mixture of certain

* Chimie appliquée à l'Agriculture par M. le Compte Chaptal. † Chaptal.

proportions of alumina and silica, of carbonate of lime and vegetable and animal matter, appears to be the best suited for absorbing the humidity of the atmosphere, of preserving it, and transmitting it the most regularly to the plant.

Neither does it appear that the prevalence of any one earth in a soil is favorable to vegetation. Too great a proportion of alumina forms a soil too stiff and tenacious. Such a soil will, from this cause, be found to be unproductive. A soil consisting of carbonate of lime only, as we see in the case of chalk, is a bad soil. A soil consisting of alumina and carbonate of lime only, as we see in the case of clay-marl, is unproductive as a soil, until mixed with other substances.

A soil consisting chiefly of silica, is often so barren as to be incapable of sustaining vegetation at all.

Some, founding on the experiments of Sir Humphrey Davy, have been led to the opinion, that the fertility of soils is directly indicated by their power of absorbing water from the atmosphere, and that their relative fertility may be estimated by this circumstance alone. Sir Humphrey Davy compared together the absorbent power of various soils with respect to the moisture of the atmosphere, and found it to be the greatest in the most fertile. Thus; 1000 parts of a celebrated soil from Ormiston in East Lothian, when dried at 212°, gained in an hour, when exposed to air saturated with moisture at the temperature of 62°, 18 grains.

1000 parts of a very fertile soil from the banks of the river Parret in Somersetshire, under the same circumstances, gained sixteen grains.

1000 parts of a soil from Mersea in Essex, worth 45s. an acre, gained 13 grains.

1000 parts of a fine sand from Essex, worth 28s. an acre, gained 11 grains.

1000 parts of a coarse sand, worth 15s. an acre, gained only 8 grains.

1000 parts of the soil of Bagshot-heath gained only 3 grains.

It is an error, however, to hold that the relative fertility of soils may be determined by their power under the circumstances mentioned, to absorb moisture from the atmosphere. The power of soils to retain moisture when absorbed, and thus to supply it in due quantity to the plant, is also to be taken into the account. Peat-earth is a very absorbent soil, but it is not a soil of great fertility. It parts with the moisture absorbed with too great facility. Besides, to infer that the fertility of soils depend upon their powers either to absorb or to retain moisture, were to reason as if these were the only conditions of fertility in soils, which does not appear to be the case; and other experiments accordingly do not bear out the conclusion that the fertility of soils depends upon these properties. But this may be inferred, that all productive soils have a considerable power of absorbing moisture and retaining it when so absorbed, and that the property does not depend on the prevalence of any one substance, but on a mixture of several substances.

It has been found, also, we have seen, that the fertility of soils, however produced, is not dependant on the prevalence of any one mineral in the soil, but on a mixture or combination of several. But what the precise proportion of these is which is the most favorable to fertility, has not yet been determined.

Without detailing any of the numerous experiments of chemical analysis that have been made, with the design of ascertaining this and other points relating to the properties of soils, the following conclusions may be given as apparently deducible from the investigations that have taken place:

1. Soils in which the largest quantity of silica and alumina exists in the state of impalpable division, are, *cæteris paribus*, the most fertile.

2. Soils in which the quantity of silicious sand is large are comparatively infertile: while soils in which the sand is fine and only partially silicious, are comparatively fertile.

3. Oxide of iron exists in all soils, but does not influence their fertility in proportion to its larger or smaller quantity.

4. An excess of the acid combinations of the oxide of iron, and certain other saline bodies, is hurtful to vegetation.

5. Carbonate of lime exists in the best soils, and generally, though not always, in larger quantity in the better than in the inferior soils.

6. Certain earths possess the power of combining chemically with animal and vegetable matter, and of retaining it for a longer or shorter time. Thus, alumina and lime form certain compounds of greater or less insolubility with animal and vegetable matters, while silica will not enter into the same combinations; and hence it is that aluminous and calcareous soils retain for a longer time the manures applied to them than silicious soils.

7. When water is in excess in the soil, and when vegetable matter is present, acid is formed which is injurious to the productive powers of the soil. In the first stages the acid appears to be the acetic; in the latter stages, when the matter of the vegetable is being converted into peat, the acid appears to be the gallic, and the tannin principle is formed.

8. Soils, besides absorbing moisture from the air, appear to absorb carbon and other matters nutrimental to plants.

These are the principal results to which the chemistry of agriculture has conducted us with respect to soils. This branch of science, however, may be said to be as yet imperfect, and a large field of useful investigation still remains for the philosophical inquirer. Although it may be said that much has not been done with relation to the really useful, which observation and practice had not before shown, yet we have at least escaped from the errors of former opinions, and so far the path of further inquiry is more open to us.

Amongst other results to which this species of investigation has conducted us, we have seen—that the practice known to agriculturists of mixing together different kinds of earths, admit of explanation on principles founded on our knowledge of the composition of soils; that the beneficial action of manures depends upon a proper constitution and texture of the mineral portion of the soil, and that hence to derive the full benefit of manures, the province of the cultivator is to improve the texture and constitution of the soil: that the comminution of the component parts of the soil is beneficial, as rendering the whole more pervious to the air, and the vapor, and other matters, with which the atmosphere is charged: and further, we have been enabled to render our common nomenclature of soils more precise, by distinguishing them by the terms Silicious, Aluminous, Calcareous, Magnesian and Ferruginous, as silica, alumia, lime, magnesia and oxide of iron, prevail in their composition.

We might now proceed to consider the relation existing between the soils of a country, and its geological condition. This is a subject interesting to the scientific agriculturist. But however curious the investigation might prove, it is not necessary for that practical illustration of the subject of soils, which consists with the design of this work. Besides, to characterize the quality of soils, as affected by the geological nature of the country or district, is to view the subject in a somewhat more extended manner than is consistent with the common purposes of the farmer. Although it is found that a relation may be generally traced between the nature of the rocks of a country or district, and its fertility—as, in the British Islands, between the new red sandstone and the finest districts of the country; between the coal formation, under certain circumstances, and a ferruginous and somewhat ungrateful soil; between the magnesian limestone and a tract of comparative infertility; between the lias formation and one of comparative productiveness, and so on—yet many degrees of quality may exist in the soils of the same series of rocks, and in the same country; and even all the contrast between great fertility and great barrenness may be found within the limits of a single field. We must, therefore, narrow our views when we examine the soils which we have occasion to cultivate, and regard, not their properties with relation to an entire district, but their minuter shades of fertility and character.

We have thus considered their properties as determined by their external characters, and in part by their chemical composition. We may now consider their characters as determined by their vegetable productions.

Miscellaneous.

EXPERIMENTS IN RAISING POTATOES.

BY JOHN ROBERTSON, OF CARLOW, IRELAND.

Experiment 1.—Mr. Robertson marked off, on an average portion of his potato ground, four drills, twenty yards each in length; in two of these he planted potato seed of the red-nosed kidney species, and in the remaining two of the apple kind. These he earthed up in the usual way: in these earthed drills the product was six pounds (about 10 per cent) less than in four corresponding ones unearthed. In all those drills, (which were 30 inches apart,) the sets were placed from ten to twelve inches asunder. The treatment of the unearthed drills may be thus stated: They were dug at bottom twelve inches deep, and left half full of the crumbling clods; on these the potatoe were laid, and then covered about three inches with dung, over which an

inch of fine earth was drawn. When the shoots were sufficiently high, the clods were broken fine and closed about the stems, and the ground in the intervals dug deep and fine as possible, and left perfectly flat; this was the only tillage which the unearthed potatoes received. The produce was about 150 barrels* to the acre.

Experiment 2.—In order to determine at what distance in drills 30 inches apart, it is advantageous to plant the sets, Mr. Robertson proceeded as follows:

In a piece of ground of sixty square yards, (not yards square,) he planted eight drills of a new seedling cup potato at 30 inches distance; these drills, nearly 9 feet in length, he planted, at the distance above stated as follows:

Drill 1	the sets 9	inches apart, and	1 shoot left.
.... 2	6	....	2 .....
.... 3	12	....	1 .....
.... 4	12	....	2 .....
.... 5	16	....	1 .....
.... 6	16	....	2 .....
.... 7	18	....	1 .....
.... 8	18	....	2 .....

The produce was—

	Bbls.	st.	lbs.
Drill 1	0	6	2
.... 2	0	4	7
.... 3	0	3	1
.... 4	0	4	3
.... 5	0	3	6
.... 6	0	4	7
.... 7	0	3	3
.... 8	0	6	1
Gross produce,.....	1	15	2

Which is about 228 barrels, or 28 tons 10 cwt. to the Irish acre, accurately weighed. This enormous produce was from an alluvial soil light and deep.

Experiment 3.—To ascertain the result of giving unlimited room to the potato, and the depth to which the roots would run if unrestrained.

On a piece of ground trenched upwards of 3 feet, Mr. Robertson planted eight whole potatoes, each 3 feet apart in the row, with unlimited room to grow at each side. The produce was six stones, and the fibres were traced downwards 3 feet, the space they occupied being equal to that of two drills in Experiment 2.

Experiment 1 proves the inutility of earthing.

Experiment 2 gives an interesting demonstration of the advantage of free access of air, the outside drills giving such superior produce; and the advantage (25 per cent) of the double stemmed ones over the single, at the same distance, proves (combined with the other circumstances) the truth of Mr. Knight's theory, that, in proportion to the abundance of its foliage, and the free access of air and light, will be the productiveness of the potato.

From the similarity of produce in the corresponding drills of Nos. 2, 4 and 6, and in Nos. 3, 5 and 7, it would appear of little importance at what distance the sets are placed in the drills, provided they have sufficient room to spread at each side; and the extent of this must be regulated by experience.

It is of the highest importance, however, that the ground should be deeply worked and highly pulverized: for the potato fibre is extremely delicate, and cannot penetrate through a hard unyielding soil, though it will run freely through that which is loose, and occupy the pulverized intervals between the drills.

Mr. Robertson deems it highly absurd, in shallow soils, to heap on the top of the potatoes, where it affords no nutriment, the earth which, if left within the range of fibre, would feed it. However, it is to be remembered, that *some species* of potatoes strike upwards, *cups* for instance, (though it appears that Mr. Robertson used these in this experiment;) and in such case earthing is most probably useful. *Apple* potatoes have a downward tendency, and therefore may not require moulding. The species under culture, and the nature of the soil, should also materially influence the farmer as to the disposition of the manure under or over the set. It is obvious that (on a dry and porous soil in particular) in the culture of *cup* potatoes, the vegetating tendencies of which are to the surface, it is injudicious to place the manure under the sets.—*Q. J. Ag.*

* The Kilkenny barrel contains 20 stones of 14 lb.; the total was therefore about 700 bushels.

NOTES ON THE MANAGEMENT OF CATTLE.

As soon as the ploughman has unyoked his oxen, let him rub them, and press their backs strongly with his hands, pulling their hide, and not suffering it to adhere close to their flesh, for such adhesion constitutes a very injurious disease. Let him rub their necks thoroughly. The oxen are not to be tied to their cribs until they cease to perspire and pant: Nor is it proper to give them much food, even when it shall be due time to feed them; but their allowance should be dispensed in small quantities at a time, which having finished, they may be led forth to water, and enticed to drink *by whistling*; immediately afterwards, they must be satisfied with a large allowance of fodder.—*Columella.*

The temper and disposition of cattle are most approved which approach the mild and gentle, rather than the violent and fierce, still without a sluggish heaviness; dismayed at loud and blustering words, yet with such a confidence in their own strength, as not to be startled at common objects of sight or hearing, or afraid to ford rivers or pass bridges: which are great feeders, but slow in mastication: for these digest better than such as devour their food greedily and with haste, preserving their condition and bodily strength. But it would be an equal fault in one who uses laboring oxen, to make them fat as to keep them lean; for their condition of body ought to be moderate and fit for business, robust and full in the muscles, but not loaded with fat, whence they would be jaded and wearied by their own weight.—*Columella.*

The stronger and richer the land is, the more must cattle be kept up to a good pitch; for if on such land cattle are in the winter suffered to run to poverty, or are brought into it poor, they will be liable to the yellows, or the blain, and most sorts of distempers; for it is the same as if you should offer strong meats to weak stomachs.—*Lisle.*

Clover intended to be kept the second year for feed, ought not to be grazed the first year by sheep, which bite so close as to wound the crown of the roots. [The same of other artificial grasses.] The leaves and stalks of artificial grasses being full of juices, cattle fed upon them, even in the driest summers, scarcely need water. Sheep fed on clover will dung quite moist; whereas their excrement, when fed on natural grass, will generally be hard and dry. (A double advantage in the artificial grasses; during seasons of great drought, neither the grass nor the cattle will feel the common want of water.) [Cattle fed in winter upon ruta baga, do not require, and should not receive, any water.]—*Lisle.*

A young beast may eat well HALF FAT; but an old cow half fat is not eatable, for the whole body of such a cow ought to be filled with new juices. A young cow will be fat on the back, but very rarely well tallowed within; whereas an old cow seldom handles so well, but generally carries most of her fat within. A two year old ewe will fatten and tallow well. The springing or standing out of the navel, the best sign of internal fat; also, in lean cattle, such protuberance is a sign that they will fatten internally.—*Lisle.*

TRANSPLANTING.

Transplanting is the changing of the localities of entire plants.—It is effected by disengaging the roots from the soil, and placing them in new situations favorable to the growth and development of the plant.

To accomplish this successfully, it is desirable that the roots be preserved fresh and entire.

The proper seasons for transplanting ornamental and other trees and shrubs, are the spring and fall. Generally in October and November of the latter period, and March and April of the former. It is commonly best in colder latitudes to remove the more delicate shrubs and trees in spring, but where the climate is not so severe, the autumn is preferable. In the latter case, the winter is not so likely to prove injurious to them.

Those which are natives of countries equally cold and rigorous with the one to which they are removed, may be transplanted either in the spring or autumn, indiscriminately. Such as are natives of warmer climates, and have become acclimated, by culture, to higher latitudes, may be transplanted in spring. They ought to have every advantage that the warm seasons can afford, previous to their exposure to the rigors of winter.

Plants transferred to a less favorable climate, should be removed at a period most favorable for them to support the change without injury. Delicate trees, when transplanted in spring, form new roots, that take firm hold of the earth during summer. Their roots be-

come established in their position, so that there is far less prospect of injury from the severities of winter. It is a matter of little consequence, however, at which of these seasons the hardy kinds are removed.

Plants, when taken from the earth to be transferred, should be removed with much care. Should any injury be sustained by loss or a mutilation of a part of the roots, the whole body of the plant, together with the root, may be immersed in fresh water during a period of twenty or thirty hours, previous to setting it in the earth again.

The top is to be lessened in proportion to the loss the roots may have sustained. Otherwise the plant will perish from a loss of its wonted nourishment. The ordinary quantity of root being diminished, the exhaustion from *evaporation* will be greater than the *absorption* of the remaining portion of root, so that the plant will die by transpiration.

October and November, after the first frosts have arrested the progress of vegetation in woody *perennials*, is recommended as a proper season for *transplanting* them. Some are of the opinion, that the peach, plum, cherry, and most evergreens, succeed best when transplanted in spring.

Any trees, even the most delicate, may be successfully transplanted in autumn, if a little protection be afforded them by covering the root during the first and most trying winter. Where complete success is hoped, it is best to shift their locality in the fall, if possible.

The protection of most trees, shrubs and woody plants, may consist in spreading a few inches of litter from the stable around the trunk and over the roots.

Moss from the meadow and evergreen boughs are highly recommended for the protection of delicate plants. They are not liable to undergo decomposition during the winter, and thereby injure and destroy what they were designed to protect.

Delicate plants are sometimes supposed to be destroyed by too much protection after being transplanted, when, in fact, they perish for want of it, being killed by the alternate freezing and thawing of the earth at its surface. This difficulty might have been easily obviated by covering them with evergreen boughs or meadow moss.

When trees or shrubs are transplanted in *autumn*, the earth becomes consolidated at their roots, so that the radical fibres soon take firm footing in the earth, and the plant is prepared to vegetate with the earliest advances of spring.

The excavation of the earth for the reception of the roots of trees and shrubs should bear some proportion to their size. They may generally be made from four to six feet in diameter, and of about eighteen or twenty inches in depth. Large trees will require a larger opening than this, and small ones not so large.

The yellow or subsoil where they are to be located may be thrown out, and replaced at bottom with a fine mould, intermixed with a portion of good manure.

Trees transplanted should stand two or three inches deeper in the earth than they stood previous to their removal. In no cases should the extra depth exceed this.

The radical fibres are to be spread horizontally in their natural position, and the soil intimately blended with them and compactly pressed about the trunk and over the roots.

No manure should be permitted to come in immediate contact with the roots, though it should be plentifully placed about them on all sides. Should it touch them, they will be likely to sustain injury and rot.

The ground, before being trodden very hard about the roots, is to be plentifully moistened by pouring water about the plant.

In transplanting evergreens, it is generally recommended, previous to treading the earth about their roots, to pour several gallons of water about the trunk, and, after filling in with earth, to finish by treading it as hard as possible for the space of half an hour or more. This would be a good rule to follow in regard to all trees of whatever kind.

June has been considered by many as the best month for transplanting *annuals* that are cultivated as FLORISTS' FLOWERS, and September most suitable for transplanting *biennials*.

In transplanting plants of every description, it is desirable that as much earth as possible be removed with the roots. If this be done, there will be less danger of their suffering by the change of situation.

Though moist, cloudy weather is generally best for transplanting, it should not be done when the ground is very wet. The earth should be only moderately moist, otherwise it will be clammy and heavy.

The operation of transplanting is most successfully performed in cloudy days, and a little before evening previous to a shower. The reasons for this are obvious. If it be done when the earth is dry and in the middle of the day, plants require watering and shading for a considerable time afterwards.

If the root be small, or injured, or destitute of earth when taken up, it will require that the earth which is placed about it be made finer, and pressed more firmly, and that the plant be more plentifully watered. It will also require to be longer shaded.

Plants, transferred to pots and boxes, after having the soil pressed firmly about them on all sides, should also be plentifully watered and for some time shaded. Care is to be taken that the shell be placed over the aperture at the bottom of the vessel, otherwise the plant will perish through a superabundance of moisture Saturation of the earth, without an outlet at the bottom, will rot the root and destroy the plant.—*Florist's Manual.*

BLUE COLOURING MATTER FROM STRAW OR BUCKWHEAT.

We intended to have mentioned this subject earlier in the season, in order that some of our readers who had buckwheat upon their premises might try the experiment and ascertain more satisfactorily the facts of the case. But we will bring it forward now; perhaps it may be recollected in its proper season. The method which has been recommended for preparing the colouring matter from this plant is the following:—Cut the stems before the grain is fully ripe, and spread them upon the ground exposed to the sun and leave them thus exposed until the seeds drop off with ease. When the grain is separated from the stems, they are thrown into heaps, moistened with water, and left to ferment to such a degree, that decomposition takes place, and a blue colour is developed. It is then formed into balls or flat cakes which are dried in the sun or by a stove, after which, if the balls be boiled in water, they impart an intensely blue colour which is not affected by vinegar or oil of vitriol. It may be converted into red by adding an alkali, as potash or soda; with nutgalls it strikes a blacker colour, and a very fine green is afforded by evaporation. It is said that stuffs dyed blue by this preparation retain their colours well, and appear very handsome.

We have never prepared any colouring matter from this plant, nor can we vouch for the truth of the above statement, but certainly we think it worth a trial.—*Farmer and Gardener.*

RIPE BREAD.

Bread made of wheat flour when taken out of the oven or skillet, is unprepared for the stomach. It should go through a change, or ripen before it is eaten. Young persons, or persons in the enjoyment of vigorous health, may eat bread immediately after being baked without any sensible injury from it, but weakly and aged persons cannot, and none can eat such without doing harm to the digestive organs. Bread after being baked goes through a change similar to the change in newly brewed beer, or newly churned buttermilk, neither being healthy until after the change. During the change in bread, it sends off a large portion of *carbon*, or unhealthy gas, and imbibes a large portion of healthy, or *oxygen* gas. Bread has, according to the computation of the physicians in London, one-fifth more nutriment in it when ripe, than it has when just out of the oven. It not only has more nutriment but imparts a much greater degree of cheerfulness. He that eats old bread will have more animal spirits than he would were he to eat unripe bread.

Bread, as before observed, discharges carbon and imbibes oxygen One thing in connection with this thought should be particularly noticed by all housewives. It is, to let the bread ripen where it can inhale the oxygen in a pure state. Bread will always taste of air that surrounds it while ripening—hence it should ripen where the air is pure. It should never ripen in a cellar, nor in a close cupboard, nor in a bed room—the noxious vapors of a cellar or a cupboard never should enter into and form a part of the bread we eat. The writer of this article has often eaten bread of this kind, and has felt strongly disposed to lecture the mistress of the house on the subject of keeping bread in a pure atmosphere. Every man and woman ought to know that much of health and comfort depends upon the method of preparing their food. Bread should be *light, well-baked, and properly ripened*, before it should be eaten,—*N. Eng. Farmer.*

HINTS TO HOUSEKEEPERS.

A writer of your paper of the 7th ult. over the signature of Sylvanus, has offered excellent advice for curing bacon, and insists that the hogs, for this purpose, must be corn fed. How long must they be so fed is the question.

Experience has shown that it requires but a very short time to entirely change the flavor and texture of all kinds of flesh. In 1770 I resided in New-Jersey where it was the custom to take great numbers of wild pigeons in spring-nets, by the assistance of decoy pigeons prepared for the purpose. The flesh of these birds, when first taken, is always very dark, and most generally tough. I have seen more than 300 of them confined and fed in a large corn-house, and in one week their flesh has not only become tender, but as white as a well fed chicken.

In 1784, I promised to present to a brother just married a prime beef towards his winter stores. I had a fine steer and a spayed heifer in a large wheat field abounding with wild garlic; my brother named a day to send for his beef, and three days previous we killed the heifer, which, although extremely fat, was to my great disappointment, so thoroughly tainted with garlic, even to the marrow in the bones, that my house servants refused to eat it—a bad prospect for my brother, whose wagon came the fourth day; and in despair I killed his beef, which was beautiful to the eye. I did not at the time pay much attention to a remark of his feeder, who observed that the steer had not eat any thing since the heifer was killed; my trouble was the certainty of my brother's disappointment, but to my great joy, I soon received his letter of thanks, saying, that a more juicy, tender, and fine-flavored beef could not be.

The foregoing facts are known to every experienced farmer, and they have convinced me, that hogs fed upon corn for two weeks is much better than two months, for the plain reason that the flesh is equally good, and the expense is less.

Hogs, as generally managed, are not only the most troublesome, but the most costly flesh we consume, and I have, for many years, been in pursuit of a plan to lighten the cost of their flesh, which is so absolutely necessary for the establishment of every Marylander. I flatter myself that I now see my way clear, for after two years trial, I am well satisfied that the use of cymblins, pumpkins, ruta baga and clover will enable me to send more corn to market, and with two weeks feeding upon that precious grain, my bacon will not yield to that of any person. No branch of rural economy requires more attention than feeding our various kinds of stock. Our northern friends laugh and say, that in Maryland the hogs eat all our corn, and our negroes eat all our hogs. This is too true to deny, and if my mite can, in your opinion, be of any use to the public, it is at your service.—*American Farmer.*

IMPORTANCE OF ABLUTION AND BATHING.

When the saline and animal elements left by the perspirations are not duly removed by washing or bathing, they at last obstruct the pores and irritate the skin—and it is apparently for this reason, that in the eastern and warmer countries, where perspiration is very copious, ablution and bathing have assumed the rank and importance of religious observances. Those who are in the habit of using the fl sh-brush daily are at first surprised at the quantity of white dry scurf which it brings off; and those who take a warm bath for half an hour, at long intervals, cannot fail to have noticed the great amount of impurities which is removed, and the grateful feeling of comfort which its use imparts. The warm, tepid, cold or shower bath, as a means of preserving health, ought to be in as common use as a change of apparel, for it is equally a measure of necessary cleanliness. Many, no doubt, neglect this, and enjoy health notwithstanding, but many, very many, suffer from its omissions; and even the former would be benefitted by employing it. The perception of this truih is gradually extending, and baths are now to be found in fifty places for one in which they could be obtained twenty years ago. Even yet, however, we are far behind our continental neighbors in this respect. They justly consider the bath as a necessary of life, while we still regard it as luxury.

When we consider the importance of the exhalation performed by the skin, the extent to which ablution and bathing of every description are neglected in charitable institutions, in seminaries for the young, and even by many persons who consider themselves the patterns of cleanliness, is almost incredible. Mr. Stuart, in speaking of the North Americans, states in his remarks, that "the practice of travellers washing at the doors, or in the porticoes or stoops, or at the wells of taverns, and hotels once a day, is most prejudicial to health; the ablution of the body, which ought never to be neglected, *at least twice a day*, in a hot climate, being altogether inconsistent with it. In fact," he adds, "I have found it more difficult, in travelling in the United States, to procure a liberal supply of water at all times of the day and night in my bed chamber than to obtain any other necessary. *A supply for washing the face and hands once a day seems all that is thought requisite.*" But bad as this is, I fear that numbers of sensible people may be found much nearer home, who limit their ablutions to the *visible* parts of their persons and would even express surprise if told that more than this is necessary to health. Certain it is, that many never wash their bodies at all, unless they happen to be at sea-bathing quarters in summer, or oppressed with heat, when they will resort to bathing as a means of comfort, but without thinking at all of its efficacy as a means of cleanliness in preserving health. In many public charities and schools, in like manner, bathing or ablution is never thought of as a proper or practicable thing, except for the sick; and yet, it is obviously of great importance to every one, especially to the young.

For general use, the tepid or warm bath seems to me much more suitable than the cold bath: especially in winter, and for those who are not robust and full of animal heat. Where the constitution is not sufficiently vigorous to secure reaction after the cold bath, as indicated by a warm glow over the surface, its use inevitably does harm. A vast number of persons are in this condition; while on the contrary, there are few indeed who do not derive evident advantage from the regular use of the tepid bath, and still fewer who are hurt by it.

While the health is good, and the bodily powers are sufficiently vigorous, the cold bath during summer, and the shower bath in winter, may serve every purpose required from them. But it should never be forgotten, that they are too powerful in their agency to be used with safety by *every one*, especially in cold weather.

In proportion as cold bathing is influential in the restoration of health when judiciously used, it is hurtful when resorted to without discrimination; and invalids, therefore, ought never to have recourse to it without the sanction of their professional advisers.

Even where cold bathing is likely to be of service when judiciously employed, much mischief often results from prolonging the immersion too long, or resorting to it when the vital powers are too languid to admit of the necessity of reaction; before breakfast, for example, or after fatigue. For this reason many persons derive much benefit from bathing in the forenoon, who, when they bathe in the morning before taking any sustenance, do not recover their natural heat and elasticity of feeling.

For those who are not robust, daily sponging of the body with cold water and vinegar, or salt water, is the best substitute for the cold bath, and may be resorted to with safety and advantage in most states of the system; especially when care is taken to excite in the surface, by subsequent friction with the flesh brush or hair glove, the healthy glow of reaction. It then becomes an excellent preservative from the effects of changeable weather. When, however, a continued sensation of coldness or chill is perceptible over the body, sponging ought not to be persisted in; dry friction, aided by the tepid bath, is then greatly preferable, and often proves highly serviceable in keeping up the due action of the skin.—*Combe's Principles of Philosophy.*

DEMAND CREATES A SUPPLY.

The improvement of agriculture, like that of every art, manufacture, or commodity, necessarily depend on demand and production; a powerful or effectual demand will ensure produce, and excellent produce will, to a certain extent, create demand. A general nicety of taste in coach or saddle horses will call forth a superior description of those animals, and superior animals will tempt purchasers; if the inhabitants of any district who live chiefly on barley or oats, indicate a preference for wheat, and a willingness to pay for that grain, wheat will be produced, and so on. Again, as the object of every individual who engages in art or trade is to acquire gain, the advancement of an art will depend mainly on the profits it affords; an art or occupation which affords less than the average profits on capital, will only be followed by such as from habit or other reasons, cannot apply themselves to any thing better, but extra profits will command both capital and skill. From these considerations it is obvious that the improvement of agriculture depends on the profits of

capital employed in it, on the taste of those who purchase its products, and on the knowledge of those who are engaged in agriculture as a profession.

CHENAM.

Our merchants are indebted to Capt. Thomas Bennett, of the New-York and Liverpool packet line, for the introduction of this article into use here. Chenam (the East India name) is made by mixing slaked and pulverized lime with whale oil to the consistency of mortar. It is so tenacious that it adheres immediately wherever applied, and is entirely impervious to water, and becomes perfectly hard in it.

It is laid on ships' bottoms with trowels, sometimes under the sheathing and sometimes between the copper and sheathing; and, in some instances, in both places. The copper is put on while the Chenam is soft, and adheres to it so completely that no water passes between them; and it is said that copper in vessels which have a coat of Chenam wears nearly double the usual time.

Whale oil is used here in making it, because it fully answers the purpose, and is two-thirds cheaper than vegetable oil—but vegetable oil makes much the best Chenam, becoming after a short time as hard as a stone. It is suggested that the celebrated mortar of the ancients was made of lime and vegetable oil.

I understand that some experiments will be made here on roofs and outsides of houses, with Chenam, as it is believed it will effectually resist the fogs and frosts of our climate, which the common rough casting does not.—*New-Bedford Gaz. and Cour.*

VETCHES, &c. PLOUGHED IN.

Under this article may be included all sorts of green manure.—Amongst the most active parts employed as manure, I have found the wild species of the genus Sinapis, [Mustard,] ploughed in fresh in the bottom of turnip drills, at the rate of twenty tons per acre. The produce brought by auction £12, while the rest of the field, manured with twenty tons of farm-yard dung, brought only from £9 to £10 per acre. Other weeds, such as nettles, thistles, ragwort, &c. produce crops superior to farm-yard dung. Potato stems, fresh ploughed in on clover ley for wheat, I have found to produce crops exceeding by two bolls per acre in quantity, with more proportionate weight of straw, than other parts of the same field manured with farm-yard dung, but otherwise under the same circumstances. The stems from three acres of good potatoes, will manure an acre for wheat to much better purpose than 15 tons of farm-yard dung, the usual quantity allowed in that part of the rotation, clover after wheat being the crop which generally precedes fallow. Under the head of "green manure," I may mention an experiment I this year made with pea-straw converted into dung without the aid of cattle. Having something of that sort on hand about the middle of last May, and being in want of some loads of manure to finish a potato field, I had the peas threshed at the mill, and the straw and chaff carried to the side of the potato field, and made up like a large hot-bed, giving each layer of straw an ample watering. Fermentation soon commenced, and by the fifth day the mass was so far decomposed as to be easily filled into the carts. The effluvium in filling was almost intolerable. It was in this state laid in the bottom of the drills; the sets of potatoes were planted above, and the earth ploughed over the whole. Notwithstanding the dry nature of the ground, and the dry state of the weather in the summer months, the part of the field manured with the decomposed pea-straw yielded a better return than where farm-yard dung was applied.—*Loudon.*

WHEAT INSECT.

The following description of this insect, by Prof. Low, agrees with our observation of it about Albany.—*Con. Cult.*

"Certain flies also attack the wheat, at a later stage of its growth. The *Cecidomyia Tritici* is a fly with an orange colored body and white wings. About the month of June the female ascends the ears of wheat, and deposites her eggs in these by means of a fine trunk, and in a few days she perishes. The progeny being hatched in the ear, feed upon the grain. They are very small, from ten to fourteen being sometimes found in one grain, and are distinguished by being of a bright orange color. They do not extend beyond the grain in which they are born; but several grains being thus consumed on one ear, the damage done is often considerable. The larvæ, after a period, fall down to the earth, in which they burrow, and remain there till the following summer, when they ascend from the earth in the form of a beautiful fly which has been mentioned."

CUT AND UNCUT POTATOES FOR PLANTING.

Mr. Fessenden.—The following details of an experiment to ascertain the relative advantage of planting cut or uncut potatoes is at your service for publication if you think it of sufficient importance.

I planted this year alternate rows of cut and uncut potatoes. I put four pieces into each hill of the cut potatoes, and two potatoes into each hill of the whole potatoes. The hills were three feet apart, each way, and of course the number of hills in an acre was 4,840. The produce of the rows planted with cut potatoes, was at the rate of three hundred and thirty-five bushels the acre, or twenty-three thousand five hundred and twenty pounds. The produce of the rows planted with whole potatoes, was at the rate of four hundred and fifty-eight bushels, or thirty-two thousand and sixty pounds. The difference in the crop in favor of whole potatoes was at the rate of one hundred and twenty-two bushels the acre, but as there were twenty-two bushels more of seed to the acre used in planting the whole potatoes, the nett gain was only one hundred bushels. However, as one bushel of potatoes at the season of planting is usually worth two bushels at harvest time, it will be more accurate to calculate the gain at seventy-eight bushels. The kind of potatoes planted was the "*white blue nose*" which is decidedly the best potato for the table I have ever cultivated, though a moderate bearer, unless it receive generous treatment.—*New-England Farmer.*

Shell-Marl is very different in its nature from clayey or stone-marls, and, from its effects upon the soil, is classed among animal manures. The Rev. Mr. Dickson states, "that it does not dissolve with water as other marls do. It sucks it up, and swells with it like a sponge. It is a much stronger attractor of acids than they."—Dr. Horne says, that it takes six times more of acids to saturate it, than any of the other marls he had met with. But the greatest difference between the shell-marl and other marls, consists in this; the shell-marl contains oils. It is uncertain if the other marls contain any oils; but this kind, it is said contains them in great plenty.

This marl, it would seem, from the qualities which it possesses, promotes vegetation in all the different ways. It increases the food of plants; it communicates to the soil the power of attracting this food from the air; it enlarges the pasture of plants; and it prepares the vegetable food for entering their roots.

The clayey and stone marls are distinguished by their colours; viz. white, black, blue and red. The white, being of a soft crumbly nature, is considered to be the best for pasture land; and the blue [commonly called blue clay] which is more compact and firm, for corn land. In the districts where marl is much used, these distinctions of management are attended to, though either of the kinds may be employed with advantage, if the following rules are adhered to.

If marl is of the blue kind, or of any kind that is compact and firm, lay it upon the land early in the season, so as the weather may mellow it down before the last plough; and, if on pasture land, let it also be early laid on, and spread very thin, breaking any lumps afterwards which are not completely separated by the first spreading. If marl is of the white, or any of the loose or crumbling sorts, it need not be laid on so early; because those varieties break and dissolve almost as soon as exposed to the weather.—*New Edin. Enc.*

"We regulate our mode of living more by the example of others, than by the dictates of reason and sound sense."—*Lat.* And we too generally take the example from our superiors in station and fortune; a consideration which should impress their minds with a just sense of the effects which their manners, their habits, their general conduct may produce in society.

Young Men's Department.

ON THE PLEASURES AND ENJOYMENTS CONNECTED WITH THE PURSUITS OF SCIENCE.

Science administers to our enjoyment by *the variety of novel and interesting objects it exhibits.* Almost every department of natural science presents to the untutored mind an assemblage of objects, new and strange, which tend to rouse its faculties, and to excite to important inquiries and interesting reflections. The science of *mechanics* presents us with many curious combinations of mechanical powers, which, from the simplest principles, produce the most pow-

erful and astonishing effects. "What can be more strange," says a profound and energetic writer,* "than that an ounce weight should balance hundreds of pounds by the intervention of a few bars of thin iron?" And when we consider that all the mechanical powers may be reduced to the *lever*, the *wheel and axle*, the *pully* the *inclined plane*, the *wedge*, and the *screw*, how astonishing are the forces exerted, and the effects produced, by their various combinations in wheel-carriages, mills, cranes, thrashing-machines, and pile-engines!† *Hydrostatics* teaches us the wonderful fact, that a few pounds of water, without the aid of any machinery, will, by mere pressure, produce an almost irresistible force; or, in other words, that any quantity of fluid, however small, may be made to counterpoise any quantity, however large: and hence a very strong hogshead has been burst to pieces, and the water scattered about with incredible force, by means of water conveyed through a very small perpendicular tube of great length. On the same principle, and by the same means, the foundations of a large building might be shattered and the whole structure overthrown. *Magnetism* discloses to us such singular facts as the following:—that a small piece of steel, when rubbed by the loadstone, and nicely poised, will place itself in a direction nearly north and south, so as to point nearly towards the poles of the world—that the north and south poles of two loadstones will attract, and two north or two south poles repel each other; and that the power of a magnet will pass through a thick board, and turn round a compass needle with great velocity, though placed at a considerable distance.

The science of *optics* likewise discloses a variety of astonishing truths, and is no less replete with wonders. How wonderful the fact, that *light* proceeds from the sun, and other luminous bodies, with a velocity of 195,000 miles in a moment of time; that myriads of myriads of rays are flying off from visible objects towards every point of the compass, crossing each other in all directions, and yet accurately depicting the same images of external objects in thousands of eyes at the same moment,—that the thousands of millions of rays of light which proceed from any particular object must be compressed into a space not more than one-eighth of an inch in diameter, before they can enter the pupil of the eye and produce vision,—that the images of all the objects which compose an extensive landscape are depicted on the bottom of the eye, in all their colours and relative proportions, within a space less than half an inch in diameter,—that the eye can perceive objects distinctly at the distance of six inches, and likewise at the distance of ten, fifty, or a hundred miles, serving the purposes both of a microscope and a telescope, and can be *instantaneously* adjusted to serve either as the one or as the other,—and that the variegated colouring which appears in the scenery of nature is not in the objects themselves, but in the light which falls upon them, without which all the scenes of creation would wear a uniform aspect, and one object would be undistinguishable from another!

The *instrument* which the science of optics has been the means of constructing are also admirable in their effects, and productive of rational entertainment. How wonderful that, by means of an optic lens, an image is depicted in a dark chamber, on a white table, in which we may perceive the objects of an extensive landscape delineated in all their colours, motions, and proportions, and so accurately represented, that we even distinguish the countenances of individuals at the distance of a mile,—that we can see objects distinctly when a thick board, or piece of metal, is interposed between them and our eye—that the images of objects can be made to hang in the air either upright or inverted, and that representations either of the living or of the dead can be made to start up instantly before the view of a spectator in a darkened room,—that, by admitting into a chamber a few rays of white light from the sun, through a prism, all the colours of light may be seen beautifully painted on a piece of paper,—that a single object may be multiplied to an indefinite number, and that a few coloured bits of glass may be made, by reflection, to exhibit an infinite diversity of beautiful and variegated forms! How admirable the effects of the telescope, by which we may see objects as distinctly at the distance of two or three miles as if they were placed within a few yards of us; by which we can penetrate into the celestial regions, and behold the distant wonders of the planetary system, and the millions of stars dispersed through infinite space, as distinctly as if we were actually transported by a supernatural power several hundreds of millions of miles into the regions of the firmanent! And how curious the circumstance, that we can, by this instrument, contemplate such objects in all directions and positions,—that we can view them either as *erect*, or as turned *upside down*,—that we can perceive the spires, houses, and windows of a distant city, when our backs are turned directly oppcsite to it, and our faces in a contrary direction—the rings of Saturn and the moons of Jupiter, when we are looking *downwards* with our backs turned to these objects—that we can make an object on our right hand or our left appear as if directly before us, and can cause a terrestial landscape to appear above us, as if it were suspended in the sky. By the help of the *microscope* we can exhibit to a number of spectators at the same moment, a small animal, scarcely distinguishable by the naked eye, magnified to the size of ten or fifteen inches in length, and distinguish not only its limbs, joints, mouth and eyes, but even the motions of its bowels, and other internal movements; and in every department of nature can contemplate an assemblage of beauties, delicate contextures, and exquisite contrivances, which excite the highest admiration, and which would otherwise have appeared incredible and incomprehensible to the human mind.

The sciences of *electricity* and *galvanism* likewise display facts both curious and astonishing. How wonderful the operations of the electric fluid, which can suddenly contract the muscles of animals, and give a violent shock to a hundred or a thousand persons at the same moment—which moves with such amazing rapidity, that, in a few seconds of time, it might be made to fly to the utmost regions of the globe—which melts iron wire, sets fire to gunpowder and other inflammable substances, destroys the polarity of the magnetic needle, and promotes the vegetation of plants and the perspiration of animals—which can be drawn in vivid sparks from different parts of the human body, and made to descend from the clouds in streams of fire! And how powerful and astonishing the effects of the *galvanic* agency—which makes charcoal burn with a brilliant white flame, decomposes water into its elementary parts, and causes platina, the hardest and heaviest of the metals, to melt as readily as wax in the flame of a candle—which produces the most violent convulsions on the muscular system, causes a hare to move its feet, and a fowl to clap its wings, with force and energy, *after life is extinct*—throws the countenance, even of a dead man, into appalling grimaces and contortions, and excites the most rapid movements in his hands and limbs, to the horror and astonishment of all beholders.

The science of *chemistry*, throughout all its department, is no less replete with wonders. How astonishing are many of the facts which it discloses, of which the following are merely specimens:—That all the productions of nature in the animal and vegetable kingdoms, are composed of a very few simple substances, many of which are invisible gases—that water is chiefly composed of an *inflammable* principle—that the *acids*, such as aquafortis, and oil of vitriol, are formed of different kinds of *air*—that an invisible fluid, one of the ingredients of the air we breathe, will cause a rod of iron to burn with brilliancy, and phosphorus to produce a splendor which dazzles the eyes of every beholder—that the *diamond*, notwithstanding its value and brilliancy, is composed of the same materials as *coal*—that

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* Lord Brougham.

† To illustrate the importance of mechanics in aid of human power, we quote the following experiment from *Babbage on the Economy of Machinery*.

"A block of squared stone was taken for the subject of experiment:

	lbs.
1. Weight of stone,	1080
2. In order to drag this stone along the floor of the quarry, roughly chiselled, it required a force equal to	758
3. The same stone dragged over a floor of planks, required,	652
4. The same stone placed on a platform of wood, and dragged over a floor of planks, required	606
5. After soaping the two surfaces of wood which slid over each other, it required	182
6. The same stone was now placed upon rollers of three inches diameter, when it required to put it in motion along the floor of quarry	34
7. To drag it by these rollers over a wooden floor	28
8. When the stone was mounted on a wooden platform, and the same rollers placed between that and a plank floor, it required	22

"From this experiment, it results that the force necessary to move a stone along the roughly chiselled floor of its quarry is nearly two-thirds of its weight; to move it along a wooden floor, three-fifths; by wood upon wood, five-ninths; if the wooden surfaces are soaped, one-sixth; if rollers are used on the floor of the quarry, it requires one thirty second part of the weight; if they roll over wood, one-fortieth; and if they roll between wood, one-fiftieth of its weight. At each increase of knowledge, as well as on the contrivance of every new tool, human labor becomes abridged. The man who contrived rollers, invented a tool by which his power was quintupled. The workman who first suggested the employment of soap, or grease, was immediately enabled to move, without exerting a greater effort, more than three times the weight he could before."

oxymuriatic acid, or the bleaching gas, discharges all vegetable colours, and, in the course of a few minutes, will change a piece of printed calico into a pure *white;* and likewise burns all the metals, dissolves gold and platina, and suffocates all animals that breathe it, after one or two inspirations—that there are metals much lighter than water, which swim in that fluid and burn spontaneously with a bright red light, and when thrown into the mineral acids, inflame and burn on the surface, and in oxygen and oxymuriatic acid gas produce a white flame, and throw out numerous bright sparks and scintillations,—that a certain kind of air, called the nitrous oxide, when inhaled into the lungs, produces an extraordinary elevation of the animal spirits, and irresistible propensity to laughter, a rapid flow of vivid ideas, and a thousand delightful emotions, without any subsequent feeling of debility or exhaustion—and that it is not altogether improbable, according to the deductions of some modern chemists, that "*oxygen* and *hydrogen*, with the assistance of the *solar light*, are the only elementary substances employed in the constitution of the whole universe;" so that Nature, in all her operations, works the most infinitely diversified effects, by the slightest modifications in the means she employs.

Such are only a few *specimens* of the curious and interesting subjects which the physical sciences present to the reflecting mind—And is it conceivable that a rational being can make such objects as those I have now specified the subject of his frequent study and contemplation, and not feel pleasures and enjoyments far superior to those of the mass of mankind, who are either immersed in sensuality, or enveloped with the mists of ignorance? The man who has such subjects to study and investigate, and such objects to contemplate, can never be destitute of enjoyment. If happiness depends on the activity of the mind, and the range of objects presented before it,—wherever he is placed, whether at home or abroad, in the city or in the country, he can never be at a loss for means of mental gratification, and of increasing his stock of intellectual wealth.—He needs not envy the rich and the noble, on account of the elegance of their mansions and the splendor of the equipage; for the magnificence and glories of the universe, and all the beauties of terrestrial nature, lie before him, and are at all times ready to minister to his enjoyment. In investigating the admirable arrangements which appear in the economy of creation, in tracing throughout that economy the perfections of his Creator, and in looking forward to a nobler state of existence where his views of the divine empire shall be expanded, he can enjoy a satisfaction and delight which the wealth of this world cannot bestow, and which its frowns and calamities cannot destroy.—*Dick on Knowledge.*

THE CULTIVATOR—JAN. 1835.

TO IMPROVE THE SOIL AND THE MIND.

TO THE PATRONS OF THE CULTIVATOR.

GENTLEMEN—We address you as farmers, as following a pursuit in common with us. The year 1834 has closed, and 1835 begun. It may be useful to look back and see what we have done in 1834, that if possible we may gain from the experince of the past, and be stimulated to greater exertions, guided by a more intelligent spirit for the future. At best, our lives are those of constant exertion; but when our labors are rewarded, and our hopes cheered, by fruitful returns, and all the comforts that necessarily follow, we look back with pleasure upon the past year that has ensured us the reward of our toil. This gratification is not lessened by a feeling of independence that springs from well conducted efforts, nor by the estimation in which we see ourselves held by an intelligent community. Under such circumstances we proceed with renewed energy to our work, and whether by the evening firseside or under an August sun, we feel the same buoyancy of spirits—the same ardent desire to press forward its execution. Seed time and harvest, summer and winter, follow each other in quick succession, and so do our lives; but when *our* summer is gone and winter is come, we will have at least the consolation to think, that our lives of industry and sobriety have not shortened our days or lessened our enjoyments, but that old age will find us with no premature infirmaties, but with a reputation well established, and a competence to support our declining years.

To gain from the experience of the year that has gone by, we must take a retrospect of its pursuits. And first as to ourselves. The Cultivator was commenced in March, 1834, and we have issued eleven numbers. The paper has been extensively circulated, and our patronage is as large as we had any reason to expect, and is still extending. Our contemporaries have spoken well of the work, and our farming community have given it a liberal subscription. They have not, however, given it the contributions of their pens, the result of their diversified experience; and if the paper is not as useful as it ought to be in the extent and variety of its intelligence, they are in a measure to blame, because by withholding that which would add to its interest, they check its usefulness and show an indifference to its complete success. As to ourselves, we do not boast of our labors—far from it—we could wish for greater talents, aided by a deeper research and more unceasing application to make it more practically useful to a reading public, and so far as the experience of the past can be useful, so far we promise to make it a more acceptable vehicle of agricultural intelligence for the future.

And now, farmers, have you done justice to your profession, to your families, and to your country for the last year? To your profession, have you cultivated your grounds with all the assiduity and zeal of which you are susceptible? Have you called to your aid all the agricultural reading within your reach, and taken advice from those of your neighbors who are competent to give it? Are your farms generally in better condition than they were one year ago? Are your fields better laid out and enclosed—your waste grounds less—more of it grubbed up and improved—your ditches opened—useless stones removed, and the general surface of the ground better adapted for the raising of crops? Has your land been made richer, to enable it to yield more, and have you collected a large amount of materials to increase your annual stock of manure? Are your houses more comfortable, besides of a neater appearance from the labors of the year? Have you added to the conveniences and safety of your barns, to make them better adapted to the purposes for which they were built? Has your stock of cattle and horses improved not only in number but more in quality and appearance, and consequently in value? Have you selected, and do you raise the best kinds of sheep—we mean those kinds that are the most profitable to the owner? or do you still follow the old practice of having a few strolling animals that enjoy the delightful privilege of providing for themselves both in summer and winter, and when you want are always obliged to look for several hours to find them, and that attained, have the felicity to count at least one less in their number? Have you the most profitable breed of hogs, and do you carry just so many through the winter as best conduces to your interest? In short, have you so farmed it in all things that you have no cause of regret, because you have given to all a proper degree of attention and care? If so, we congratulate you; but if not so—if you have not done one, a part, or all these things, the year has been in a measure lost to you, and you have not done justice to your farm or your profession.—Take another year of probation, turn it to better account, and let your diligence give evidence of a thorough reformation. But if you will not, if experience cannot teach, and the prospect of harassing debts hereafter cannot incite you to a noble industry, you will soon become an evil in a neighborhood—your example will be injurious to others, and your slothfulness and unthriftiness will assuredly lay your farm under a cumbersome mortgage. This once imposed, the next step is a disposal of it by a creditor at auction.

We turn from such with disgust, and ask next, have you for the last year, done your duty to your family? That is, have you made the labors of the farm as cheerful to all your dependants as circumstances would allow? Have you been so far kind and indulgent as was consistent with the proper management of a well regulated household? Have you attended to the education of your children and apprentices, and, as far as one short year would allow, given them all the opportunities to acquire information that may be useful to them hereafter in their several pursuits, and that with intelligence they may support the free institutions of our country? If you have done this, you have done your duty; but let us at the same time remark, that education is on the advance: what was necessary for our generation is not enough for them. The march of intellect is onward, and our present attainments are comparatively small, and will be still more undervalued, in the advance of the generation to come.

Have you done your duty to your country? Have you given the necessary aid that the good of society demands at your hands—to the bridges, roads, public improvements in your respective neighborhoods, to schools, seminaries of learning, public morals and religious

institutions? These are all great and important duties, and in a well regulated community ought not to be slighted or forgotten. Society cannot flourish without them—they are the stamina that give stability and health to our country and its government, and that man is unfit for associated life—he is wanting in principle and reckless of consequences, who will not lend his aid to the attainment of these great and important objects.

Should our sheet continue its labors through the changes of the year, and at the end of it we appear again before you, we hope to meet you under still more auspicious circumstances. Our first wish is for the prosperity of our country; the next for its agriculture—and we hope to find you not only more zealous in the pursuit of it, but more willing with you pens to lessen the labors of your hands. Depend upon it, when mind is brought to operate upon the stubborn soil, it removes obstacles, creates facilities and gives an expansion to our ideas, a directness to our efforts and a success to crown them, that hard knocks alone cannot overcome. With these remarks, we wish you all a happy New-Year. A.

AGRICULTURAL REPORT FOR 1834.

Although the quantity of *wheat* raised in this state, is annually increasing, from our becoming rather better acquainted with the plant, and a denser population, and consequently new grounds coming under the use of the plough, still the crop, considered as a whole, and allowing a pro rata calculation for the causes of its increase, is not as great this year as it was in 1833. The winter of 1833-34 was what is called an open one. A good deal of wheat was frozen out in the course of it, from the want of snow, which is essential to a good winter crop. The spring of 1834 was favorable to its growth, but in the early part of the summer, the weather was extremely hot and dry. The thermometer for some weeks in July, ranged nearly at 90°, and no rain to moisten the earth and cool the atmosphere. This weather was not injurious to wheat in particular localities, but in other parts of the state, the wheat suffered from blight, rust and in a few of the midland counties from the depredations of the grain-worm, supposed to be *Vibrio Tritici*. This grub made its appearance in June, was most troublesome in a few counties north of Albany, where it committed great ravages, and from whence it will probably spread to contiguous counties the succeeding season. The earliest indication of its appearance hereafter ought to be carefully noted, and its method of propagation and propensities closely observed, in the hope that it will lead to the adoption of a plan for its extinction. Generally speaking, the crop was of less weight too than the last year, and would hardly average 60 lbs. to the bushel, which is less than the weight ordinarily of our wheat. The price, too, has been at least 15 per cent less than the last year. We presume this was imputable to rather a lessened demand for many of our productions.

Wool.—The quantity grown in this state is annually and rapidly increasing, and the quality improving. Farmers generally are becoming better judges of both the animal and its fleece, and raise more of the valuable kinds. The native sheep have been much improved upon by intermixture with the foreign varieties, and we bid fair by a careful attention to this branch of agriculture, considering our facilities for its prosecution, to rival the English in the quality and weight of carcass, whilst we compete with Saxony and Spain in the fineness of the fleece. Perseverance will in a short time effect this, for the American wool is now preferred by our own manufacturers to a rather finer quality of foreign, because it works up better. The home market being supplied, the prospect is, we will soon see the time when it will be sought after from abroad. The price was about the same as last year, if any thing rather better; the supply on hand, now in the country is not large, and will probably be very nearly consumed by the manufacturers this winter, and the coming spring. The importation the last season has been small, and the prospect of the price for the crop of 1835, as flattering as the one just disposed of. The last public sales previous to the suspension of navigation by winter, (and which are a criterion not only of the quantity in market but the prospect of what the price is likely to be for months to come,) was quite as good as former sales, and if any thing rather in advance. The price of the article in Europe remains much the same as it has been some months previous, although there were reports to the contrary. The manufacturers of woollens in Europe have constant employment and a brisk demand for their products.

Indian Corn.—In this article for the last year there has been a great falling off in the quantity. The prospect for a crop was never more flattering than it was in the month of June last, when the coolness of the preceding spring had abated and the warm weather set in, but early in July the drought commenced, which continued nearly three months. The corn suffered very much from it. The crop taken as a whole, was not over a half yield, but the quality is good, and none was lost for want of ripening. Although this crop is small, the price is not advanced beyond the previous year. Corn is more extensively cultivated than formerly, and in ordinary seasons more is raised off of an equal quantity of land. It delights in a warm rich soil—clayey lands are not congenial to its growth without they are well manured, and we have a wet but warm season. Under such circumstances they will produce heavy crops, but it requires a late fall, (that is, late frost,) to ripen it. In suitable situations it is a profitable crop, next only to wheat, for it yields not only heavy crops of grain, but large quantities of the best of provender for a winter supply for stock, at the same time that it materially adds to our supply of manure. It is more extensively cultivated in the southern and middle than in the western portions of our state.

Oats are our next best crop. As they are extensively cultivated the supply in a measure supersedes the demand for corn. They do well on lighter land. The spring and summer were both favorable to their growth, and they probably suffered less from the drought than any other kind of grain. This crop, taken as a whole, was rather more than an average, and their growth seems to be congenial to all situations and soils. Upon the highest hills and lowest valleys—upon the lightest sands or heaviest clays, they make the best of circumstances, and thrive in all places—but from their greedy nature they exhaust the soil, and for that reason ought not to be extensively cultivated. The price about the same as last year. Stock will eat this straw next in avidity to that of corn.

The increasing demand for *barley*, for some years, has rendered its culture of the first importance in many of our agricultural districts, particularly in towns near and contiguous to the Mohawk, and even farther west; and it gives us pleasure to say, that the crop has been good—better than medium, and the quality fair—though prices, probably from the abundance of the crop, have not sustained their usual grade.

Hops have yielded too a fair crop, though we are sorry to say the quality has, as usual, been bad. The growers have suffered greatly in their prices in consequence of either the premature gathering of the crop, or of its having been injudiciously cured. But few good samples, we are told by buyers, have been offered in market; but these have brought a good price.

Potatoes were a light crop—not more than one-third of an average yield. It was entirely imputable to the dry weather, and they are now an article both high in price and in great demand. The kinds of potatoes generally cultivated are bad in quality and not over large in product. In both they are susceptible of great improvement, and it is against the farmer's interest that they do not receive it.

Pork has not been as cheaply fattened nor as much sought after as last year. The want of apples this year has been a serious loss to this interest, and the consequence was that to fit our hogs for market drew too much on our grain crib, which has made the fattening of the animal extremely unprofitable. The price, too, from there being much old pork left in market of last year, was a falling off.

Apples and fruit there were none.

Upon the whole, the year has not been as extensively prosperous to the farmer as the preceding one. The dry weather beginning in July has not ended even now, and winter has commenced with the fountains almost dried up and the streams of water low. But farmers will never despond, throwing themselves upon the bounties of Providence and their own industry. The spring of 1835, will see them recommence their labors with redoubled activity and zeal, as they act upon the motto that if they cannot "command success, they will at least try to deserve it. A.

EXCRETORY POWERS OF PLANTS.

Science is continually making new discoveries of the laws which regulate the animal and vegetable kingdoms, and furnishing new and useful suggestions to aid the operations of skill and industry. It is hardly two centuries since the circulation of the blood was fully confirmed by Harvey. The discoveries in vegetable have been more tardy than those in animal physiology. The laws which govern the

vegetable kingdom are yet but imperfectly understood by the learned, and are much less known to the unlearned. But chemistry is successfully at work in disclosing useful facts in vegetable economy, before unknown. Among these, it has been declared, and satisfactorily demonstrated, that plants possess excretory organs, by which they throw off such matters as do not afford them nutrition, or which are not essential to their wants. It seems to be admitted, that plants take up, indiscriminately, the vegetable food which presents, in a prepared form, to their spongeoles, or mouths; that they have no power of selecting their food in this stage of nutrition; but that when the sap has been elaborated in the leaves, they have the power of retaining only such portions as food as are congenial to their wants, and necessary to their perfect development, and of throwing off the residue into the soil. As plants differ essentially in their properties and products, it would seem to follow, that different proportions of the elementary matters which constitute the food, and make up the substance of vegetables, and in various combinations, must be required by different species, or in other words, that they do not all subsist upon and exhaust the like food. This is proved by the experience of every farmer, who finds it profitable to alternate or change his crops, and prejudicial to crop a field two or more years in succession with the same grain.

The conclusions which some philosophers have drawn from these facts, viz. that the excrementitious matter thrown off by plants is a sort of poison to the like species—and that *hence* the necessity of alternating crops—is at least of very doubtful authority; and to our minds seems to be contradicted by theory as well as practice. And if the inferences are to be admitted as a general rule, this general rule certainly admits of numerous and broad exceptions.

Soils are impoverished, not by what is *grown upon them*, but by what is *carried off* from them. If the crop is all retained upon, and returned to the soil, fertility will rather be increased than diminished; and the same crop may be made to follow without deterioration. The reason is simply this, that the very matters which constituted the dead crop, remain to be transmuted into the living one. But when the product is carried off from the ground, the soil is robbed of part of its specific food for the like crop. We have several familiar illustrations in proof of our position, some of which we beg leave to mention.

We have seen poor waste lands enclosed, from which cattle were excluded, and upon which the stinted herbage had been suffered to remain and rot—and although the same plants grew upon them annually, the herbage and the soil annually improved.

We have seen about buildings, waste patches, where nettles, burdocks and other foul weeds were permitted to luxuriate unmolested, and to fall and decay upon the ground; and every succeeding growth seemed to increase in vigor.

We have seen lands that were never cultivated, particularly wet grounds, covered with the same annual plants for successive years, without perceiving any sensible diminution of growth.

The vast prairies of the west, and indeed all our wild lands, have produced annually the same herbage, probably for centuries; and yet we do not learn that this herbage is less luxuriant now than it was half a century ago.

These facts, and many more that might be cited, go to disprove the hypothesis of De Candolle, Macaire, Rennie and others, that the excrementitious matter of plants is poison to their own species. The undiminished, or rather increased fertility, in the cases we have referred to, arises from the circumstance, that nothing is carried off from the ground: that what grows upon the soil is returned to it again, and becomes proper food for its own species.

The preceding cases have reference only to uncropped grounds. Let us now test the hypothesis by known results in farm culture.

There are many perennial cultivated plants, the circle of whose roots does not materially enlarge, which are cropped, and thrive in the same locations for years, the vigor of whose growth may be increased by the liberal application of manure. We give asparagus as a familiar illustration. The roots of the plant are interwoven, and virtually fill the bed the first year of their growth; and yet the plants continue to increase in vigor for some years, under good culture. This they could not do upon the assumed doctrine we are combatting.

Wheat, of all the cultivated crops, should afford proof of the poisonous nature of its excretory matter, if such matter is truly deleterious. Upon ordinary soils, this grain will not bear repetition in successive years, without great diminution in product; nor would it upon *any* soils if Macaire and Rennie were right in their conclusions. Yet upon some soils, highly charged with its specific food, it *does bear repetition* for many years. In reference to this question, we made particular inquiry last summer, in a circle of intelligent gentlemen at Auburn, "how many years in succession any of their grounds had been known to carry wheat?" An instance was given, in reply, where wheat had been grown on a field twenty-one out of twenty-two years; and a second was immediately noted, where it had been grown *twenty-two years in succession*. Turning to our informant, we asked, "what was the product of the last crop?" "Forty bushels per acre," he replied. "Was the ground manured?" "No." These cases, we believe, are not singular, though they may indicate bad husbandry. In several districts in the west, and in some in the Canadas, wheat has been grown many years in succession, and constitutes almost the exclusive crop; and on what are termed the oak openings, we are told, there has often been an increase of crop, for successive years, and this without the aid of manure.

Let it not be supposed, from our remarks, that we are opposed to an alternation of crops; on the contrary, we consider it the basis of good husbandry. The theorist, as well as the practical farmer, admits its great utility. But the necessity of this alternation, we contend, does not arise from *a poison* deposited in the soil by a previous crop, but from the exhaustion of *food* by that crop—the *specific* food of the species. Whichever party may be right as to the cause of infertility, both are agreed as to the preventive means, which is the main point. Because some lands *can* bear successive crops of the same grain, it is no proof that it is wise to *require* them to do it—or that other lands can be made to do the like. The reasons in favor of the alternation of crops are not weakened by the arguments upon either side, but rather acquire new force from both.

Morus Multicaulis.—It appears from the deliberations of the French Royal Society of Agriculture, which we find noted in the Farmers' Register, that the Chinese mulberry is not a distinct species; that its seed will not produce its like, and as a valuable variety, cannot be preserved except by multiplying it by cuttings, grafts or layers; and that it is exclusively by these means the Chinese cultivators have reared this tree from time immemorial. Seeds sown near Venice have produced varieties, but none like the true morus multicaulis.

SHEEP HUSBANDRY.

The rapid increase of woollen manufactories among us for the last fifteen years, and the corresponding increase of our flocks, render it obvious, that sheep husbandry has already become an important branch of our farming, and a source of individual and public wealth. And when we consider, that neither our woollens nor our wool are equal to the home consumption—that both are already becoming articles of export—and that wool is now profitably grown upon our most valuable farms,—we have good reasons to believe, that the time is not distant, when wool will become one of the prime staples of the north, as cotton has, within a few years, of the south. Impressed with this belief, the conductors feel desirous of rendering the Cultivator a useful vehicle of information upon this important branch of our industry; and while they earnestly solicit communications upon this subject from practical husbandmen, they promise to contribute such information as their observation or reading may suggest as valuable. With this view, they have collected some facts, from high authorities, for this number, which will be found under the head of *Sheep Husbandry.*

There is little doubt but that the mountainous and hilly districts of our state, at present of comparative little value, will ultimately become our most profitable sheep grounds. They will afford a more healthy range for these animals than flat rich lands, and sheep will be maintained with far less expense upon them than upon the latter. Sheep delight in pure free air and dry pasture, and are constitutionally fitted for rocky and stony situations; and indeed it is contended by some, and with much reason, in our opinion, that stony grounds are important to their health;—that on stony dry soils, they are not subject to the foot-rot and other distempers which are known often sorely to afflict them when kept on moist soft pastures. Many of the farmers in England pave the yards in which sheep are folded. If these animals can be profitably maintained upon farms worth from fifty to one hundred dollars per acre, they can be maintained with greater profit upon hilly lands costing from two to twenty dollars per acre; for certainly the difference in the herbage of the two descriptions of

land will bear no proportion to the difference in price. Of all products of the farm, wool will best bear the expense of long transportation to market. When on a late visit to a friend in Massachusetts, we were told by an intelligent resident, that fifteen years ago most of the farmers of the town were deeply in debt, and their farms going to ruin; but that sheep husbandry, to which all but two or three had since turned their attention, had given an entire new aspect to their affairs; and that he would then engage to pay every debt owing by the inhabitants of the town, for the surplus produce of that season. It seems to be well established, that the soil, as well as the owner, of a sheep farm, become enriched by the flock.

As particularly applicable to the season, we recommend to all who stand in need of our advice, that they keep their sheep dry, give them pure air, and plenty of food, and carry them to spring grass, by all means, in good flesh. Ten well kept sheep are more profitable than thirteen badly kept. To protect them from storms in winter, you should have a covered shelter for them to resort to at night. To ensure them pure air, this shelter should not be habitually, if at any time, wholly closed at the sides. To keep them dry, they should have a liberal supply of straw litter, and this often repeated. This will also become a matter of economy in regard to manure, as the straw will absorb and prevent the loss of the urine, which is a moiety of the manure. To keep them in good health and good plight, feed them well, stint them not in salt; and feed turnips, potatoes or coarse grain occasionally, particularly to such as have to give suck. If you have not the roots, by all means provide them another year; for rely upon it, there is no more profitable winter, or rather spring food, for sheep, than Swedish turnips—they are wholesome, nourishing, and tend greatly to enrich and increase the milk of the ewes. Green food is besides highly valuable for all farm stock in the spring of the year.

UNHEALTHINESS OF VEGETABLE CELLARS.

We insert to-day, a communication upon this subject, from a medical correspondent; and, without wishing to trespass on the province of the profession, we beg leave to make some additional suggestions.

Pure air is all-essential not only to animal, but vegetable health. All farm stock are most healthy, and thrive best, when kept in a cleanly condition, and permitted to enjoy a free circulation of air. Vegetable putrefaction, and animal respiration, vitiate, and render air unhealthy, and often become the imperceptible cause of sickness and death. Many of the diseases which man is incident to, owe their origin, or are materially aggravated, by neglect of personal cleanliness, by living in close apartments, or by breathing impure air, vitiated by the putrefaction of vegetable matters, by animal respiration, or by combustion: For however comfortable it may seem, in cold winter weather, to sit or sleep in a hot, close stove room, both are deleterious to a hale constitution—the purity of the air becomes impaired in proportion to the closeness and warmth of the room, and the numbers of its inmates. Hence there is found most sickness, and the greatest mortality, in small, hot and crowded tenements; and hence epidemics prove most fatal in situations where the importance of pure air and cleanliness are disregarded. With regard to depositing vegetables in the cellars of dwellings, it is a general practice, and however detrimental it may prove to health, there is little prospect of seeing the practice materially abated. Experience has pronounced it convenient, and safe in regard to the effects of frost. But much may be done, and with little trouble, to lessen the evils which may result from it. In the first place, every cellar should have a good drain to carry off all water. Stagnant water, especially when mingled with the vegetable matters which are ever found in cellars, is extremely deleterious to health. In the second place, cellars should be ventilated as long, and as much, as the temperature of the weather will permit. All vegetables are best preserved in a temperature a little above the freezing point. For this purpose, cellars should be furnished with a hatchway and windows, with gratings or slats, for the free admission of air, and these should not be closed till imperiously demanded by the severity of the season. In the third place, every decaying vegetable matter should be promptly removed as soon as discovered, and all vegetables should be removed to an out-building, and the cellar thoroughly cleansed, as early in the spring as the weather will permit, and the windows and door unclosed for the escape of the impure, and the admission of fresh air. If cellars are floored, the bottoms ought to be brick, stone or water cement. Much filth accumulates under a wooden floor, and the decay of the wood adds to the deleterious properties of the surrounding air. And in the last place, nothing has a greater tendency to purify the atmosphere of cellars, than whitewashing their walls, ceilings and timbers with lime, as soon as they have become sufficiently dried by ventilation and the advance of spring, to permit the operation to be well performed. With good housewives, this is the last operation of the annual house-cleaning process in May. It proves not only beneficial to health, but evinces a tidiness of management grateful to the senses, and highly commendatory of those who practise it.

MAKING CLOVER HAY—IN COCKS.

Nothing is so hard to combat as the prejudice of farmers, who think they *can learn nothing* in their business. We have often recommended curing clover hay *in cocks*, as a means of doubling the value of this kind of hay, besides lessening the expense of curing it. Many good farmers, and intelligent men, have ridiculed the process, because it run counter to their practice, and was what they could not reconcile to their idea of good management. But they would never make the trial; if they had done so, they would have seen that they were wrong, and we right. We beg leave here to say, that in many districts of Great Britain, spreading hay from the swath, or tedding it, is going wholly out of practice, as causing unnecessary labor, and as diminishing the value of the hay. But there they are not blessed with our ordinary sunshine and heat in the haying season. The hay curing process, with them, is a business of some days, on account of their comparatively cool climate and humid atmosphere. But with us, when the grass is matured, and *thin*, and the weather good, it is often the business of *a day*. But this cannot be the case with us with early-mown hay, particularly where clover abounds. The grass is then full of juices, and the succulent stocks of the clover require time, as well as sunshine, to part with their moisture. Spread and exposed to a hot sun, the leaves, blossoms, and exterior of the stems soon dry, but in drying, the exterior of the stems become indurated, and refuse, like wood painted when green, to part with the interior moisture. The consequence is, the grass must either be housed in this half-cured condition, and spoil in the mow, or, if the curing process is completed, so as to prevent damage, the leaves and blossoms, which constitute the best parts of the hay, are over dried, crumble and are lost. Cured in cock, every part of the grass, whether the leaves or thick stocks, dries alike, and is alike preserved, and the evaporation of moisture goes on, I believe, even in wet weather: for a partial, though in no wise a prejudicial fermentation takes place, and the rarified air which it generates, being specifically lighter than the atmosphere, is constantly passing off.

We have been induced to these remarks, at this untimely season, in consequence of finding in *The Farmer and Gardener*, an agricultural paper published at Baltimore, a communication from John Smith, fully confirming the utility of our recommendation and long practice. It would seem that Mr. Smith was led to make the experiment rather from necessity than from choice. But we will let him tell his own story.

"It will perhaps be recollected," he says, "by all attentive agricultural readers of that paper [the American Farmer] that it was recommended to farmers to put their hay, in its green state, or as soon as cut, into small cocks, and cure it by sweating.

"When I commenced cutting my clover hay the present season, the prospect for favorable weather was flattering, but in a short time it changed, and it became evident we should have a wet spell. I then dropped the scythes, and put all hands to putting up the grass (then perfectly green, but exempt from external wet) into cocks of about 200 pounds cured hay, building them compact and high, to avoid the introduction of rain as much as possible. Rain came on before I secured all the cut grass, but the next day was fair, and I succeeded, by unremitted attention, in getting the water dried out of the remainder, and put it up in the same way. *It continued rainy* TEN DAYS, and afforded no opportunity to cure in the sun; the cocks were examined daily, by running the hand and arm into them, and, contrary to all expectation, gave no indications of fermentation. At the end of ten days the weather became fair, the cocks were opened, *and found to be in a perfectly sound condition*, except so far as the rain had penetrated, and the external wetting alone, in my opinion, made it necessary to open it at all. Tell farmers they need not fear losing their hay on account of unfavorable weather at harvest. I have never seen worse weather in hay harvest, *and I saved mine entirely well.* IT IS MOST EXCELLENT HAY."

Our practice has been, except in cases of necessity, like the one above, to let our hay wilt in swath, that is, to cock in the afternoon that which is cut in the forenoon, and not to have the cocks exceed fifty to seventy pounds hay when cured. We are glad to see that a larger quantity will cure well. Let it be remembered that the cocks must not be made by *rolling*, but by placing, with a fork, one layer above another, till the cock is completed.

Under-draining.—We copy into the present number, an excellent article upon this subject from the Edinburgh Quarterly Journal of Agriculture. Our reasons for publishing so much upon this subject, result from a conviction, that no department of our husbandry has been more neglected than draining,—that few operations are more important to good husbandry,—and that we are wretchedly defective in theoretical as well as practical knowledge, in this branch of farm labor.

CORRESPONDENCE.

Seneca Falls, Nov. 24, 1834.

SIR,—Having recently become a subscriber to your paper, I have ventured to address you on a subject which has for a short time occupied my thoughts, in the hopes of gaining information myself, as well as calling the attention of older and better informed minds to the contemplation of the same subject.

It is this: The universal practice of building with *vegetable cellars* underneath dwelling-houses, considered in connexion with the health of the occupants.

It may *seem* strange that I should trouble you with a subject having so little apparent connexion with the exclusive object of your journal. I do it, because (in my opinion) the persons whom your paper is most especially intended to benefit, are most interested in the subject.

It would be very inconvenient, if not impossible, for those building in crowded cities, or large towns, to spare room sufficient for what is commonly called an "out door" cellar. But the case would be different with those who are engaged in agricultural or horticultural pursuits. The latter also usually store a larger quantity of vegetables in their cellars, and would be more likely to suffer from the evils of the practice, if there are evils arising from it.

Now, sir, it is generally admitted, and indeed well proven by facts, that the gases arising from the decomposition of vegetable matter, are the principal cause of most of the diseases to which the human frame is subject. These gases are usually termed Malaria (or evil air) and Marsh Miasma.

It was formerly supposed that this air only originated from marshes, and had some mysterious character. (It is, indeed, most abundant and most noxious in the vicinity of marshes, because their vegetation is most luxuriant, and decomposition most rapid, from the constant presence of water, a necessary agent in the voluntary decomposition of vegetable matter.) But as the science of medicine has advanced, the cause, nature and connexion of diseases is more thoroughly understood, the mystery has disappeared, and it is ascertained that wherever vegetable matter is suffered to remain "en masse" until decomposition takes place, or in other words, till it rots, there is a very hot-bed for the production of that which causes fevers, small-pox, cholera, &c.

Now I will propose the question, whether the storing of vegetables under dwellings is not the cause of most of the casual *fevers* which afflict the country, and whether much sickness might not be prevented by the construction of vegetable cellars in places disconnected with the dwellings?

The question, in the extent to which I would apply it, is new to myself. I therefore propose it, that if you should think it of sufficient importance, you may notice it in your journal, with whatever light you can throw upon it, and also, that others who may be acquainted with any facts, either "pro or con," may be induced to submit them, with their own thoughts on the subject.

I will very briefly state a few reasons why I am inclined to answer the question in the affirmative; and,

1st. The malaria is lighter than atmospheric air, consequently, it has a tendency to rise through the crevices in the floor of the house, as soon as it is generated by decomposition, especially if the cellar is kept closed, as it usually is during the night, and passing through the house, mixes with the air of the rooms, which is already rendered impure, and its adaptation to the purposes of human life much lessened, by frequent breathing. In this concentrated and doubly poisonous state, it is inhaled by those asleep. This might account for the fact, that a great number of those who suffer from fevers and other diseases, feel the first symptoms of the disease, either in the night, or when they first awake in the morning. Although the malaria is lighter than pure atmospheric air, yet it mixes with it, and as it becomes diluted by it, loses its power of communicating disease, so that if it is under the necessity of passing but a very short distance, either perpendicularly or horizontally, in situations where it is exposed to the free action of the atmosphere, it is rendered comparatively inert. I could, if necessary, cite many instances to prove this, and probably you yourself are acquainted with some, where, when disease has been rife in some districts of a city, the air which caused it has been deprived of its power to infect by merely crossing a narrow street.

2d. Even fresh vegetables, when first buried or secured, undergo fermentation to a considerable extent: witness the necessity of making air-holes in the earth covering vegetables, which are buried out of doors, for the purpose of suffering the gas which is generated to escape.

I will close with one more reason: Cellars are always damp, and frequently very wet, and in the best of them there is sufficient moisture and heat to produce fermentation, so that many of the vegetables kept over winter are found to be decayed in the spring. In some, vegetables in a half-rotten state are suffered to remain month after month. I have frequently heard those who have had much sickness in their families ascribe it to the water which was standing in their cellar, whereas water of itself would, even in this case, be perfectly harmless; but if a quantity of vegetable matter were in the cellar upon which the water might act, as an agent in decomposition, the sickness would, to my mind, be satisfactory accounted for.

For these reasons I am inclined to believe that so much disease as is produced by this practice might be avoided by making "out-door" cellars for vegetables, even though but a small space intervened between the house and the cellar.

Yours, respectfully, W. D. C.

Milan, Huron co. Ohio, Dec. 12, 1834.

DEAR SIR,—There are twenty copies of the Cultivator received at this office, and some of us have been looking with solicitude to find something on the cultivation of hedge thorn, but find nothing, or nothing satisfactory. Situated as some of the subscribers are, upon the large prairie, destitute of timber, it becomes a subject of inquiry, "How are our farms to be fenced?"

The object of this communication is to obtain information in relation to this subject. Can you give us information, 1. Whether the hedge thorn has been successfully cultivated in this country? 2. If so, what kind of soil is best adapted to its growth? 3. Where may the seed be obtained, and what is the best method of cultivation? 4. How long will it be before sets from the seed will be sufficiently large to stop cattle and hogs?

The soil of our prairies appears to consist principally of vegetable mould to the depth of from four to twelve inches, with a subsoil of clay, very tenacious, by which means in time of much rain the earth is full of moisture, and very soft. In time of drought, the earth cracks, and its lumps become hard and impervious to the roots of most vegetables. With a proper degree of moisture, vegetable matter is very abundant, corn yielding sixty, and oats fifty bushels to the acre. Trees transplanted upon the prairie usually thrive remarkably well, but those vegetables likely to be greatly affected by a superabundance of moisture, or short periods of dry weather, cannot be expected to do well on the prairie.

Can you inform us of any other live fence besides the thorn, which would be likely to thrive and answer the purpose on our prairies? Would the yellow locust thrive so as to afford posts, &c. in a few years?

We are sorry to trespass upon your time, and the deep interest some of us feel upon this subject must be our apology for troubling you. Very respectfully, your obedient servant,

RALPH LOCKWOOD.

P. S. Our prairie farms are principally fenced with oak rails; but they have advanced in price within a few years from $1 to $4 per hundred, delivered on the line of the fence; they will last about ten years. Oak boards may be had at $1 per hundred feet, and are considered as durable as rails. We are anticipating a further advance

in the price of fencing stuff, and that we shall be driven at no very distant day, to substitute some other mode of fencing. What that substitute should be for economy and durability, and when to adopt it, is the object of inquiry. At the above price for rails and boards, the cost of fence would be 15 to 20 cents per rod per annum including interest. R. L.

REMARKS BY THE CONDUCTORS.

The subject of live fences is one of increasing importance to the agriculture of our country. We have many champaign districts of choice land, particularly in the west, and independent of prairie tracts, where there is not likely long to be a reservation of much timber ground, and where there is few or no stone to construct fences. In those districts fencing materials will soon become extravagantly high, and the inhabitants seem to be threatened with the alternative, of either dispensing with enclosures, as in France, or of resorting to live fences, as in England. The latter is decidedly preferable, not only to open fields, but to dead fences, unless in districts where fencing materials are abundant and cheap.

Caleb Kirk, of the state of Delaware, a man of the highest reputation for veracity and practical knowledge in husbandry, published some years ago, in the American Farmer, several numbers on hedging, in which he gives the result of nearly 20 years successful experience. In 1819 he states the actual cost of 1,000 feet of an efficient hedge fence as follows:

1,000 plants, planting and care first year,.....	$8 50
Dressing and care of plants six years following, ...	5 00
Expense seventh year for stakes, splashing, &c.....	11 25
Expense six following years,.....	4 50
Total expense for thirteen years, ...	$29 25
The posts and rails for 1,000 feet of fence are stated at....	75 00
Showing a gain, in favor of the live fence, of	$45 75

in the thirteen years, besides the advantage of the live fence being permanent,—as good as new—while the dead fence would have gone to decay, and required a new expenditure to rebuild it. In 1823, when Mr. Kirk's judgment had been corrected by four years further experience, he says,—"I find that forty cents a rod will complete the raising to a mature age, and one cent a rod will fully maintain for ever after, if duly attended to and applied with judgment. No failure has ever appeared, except some local cause is present; therefore durability is now well established."

We have considered the subject of live fences of that primary importance, that we intend to publish, in the second volume of the Cultivator, the best information we can obtain on the subject, in connexion with our own experience, which has been something, and to illustrate the subject by cuts or engravings. In the mean time we offer a brief reply to the queries of our correspondent.

If by "hedge thorn," is meant the English hawthorn, (*bretægus oxycantha,*) our decided opinion is that it will not answer in Ohio, as it does not do well here, in a latitude nearly parallel. We have given it a fair trial, and after patiently nursing it seven years, abandoned the hope of success, and dug up a hedge row of nearly a half a mile of it, and substituted other plants. Neither our summers nor our winters seem suited to its growth or preservation. The yellow locust is wholly unfit for hedges, from the fact that it produces innumerable sprouts from its roots, which would disfigure the hedge, and seriously encroach upon the fields. Yet we do not know of a tree which it would be more valuable to plant upon the western prairies, for wood and timber than the yellow locust. The growth is rapid, it propagates itself, and it affords a valuable material for fence posts, mill works and ship buildings. It will attain a maturity fit for these purposes in twenty-five years from the seed. But the thorns of our country afford excellent materials for live fences, particularly in the districts where they are found growing natuarally. This we state as well from personal experience and observation, as from the information of others. In the middle states we have seen good hedges of the Virginia and Newcastle, or cockspur thorns, and we have a promising hedge composed of several indigenous kinds, gathered from the woods and pastures. But the great difficulty is in managing our hedges well. Our own people have as yet but little practical knowledge on the subject, and too many of the foreign laborers, who profess a knowledge on this subject, are mere quacks at the business of managing them. Besides, our climate differs from that of Great Britain, and demands a different culture from that which succeeds there. We have more cold, more heat, more drought. The ditch and bank wil not do here, nor is it desirable that it should, as it causes a waste of ground, is unsightly, and is too often a nursury for noxious weeds. A bank and ditch require a width of eight or ten feet, while a simple hedge does not occupy more than two or three feet.

It is believed all the species of native thorn will answer for hedges, as well as many others of our native shrubs and trees. The Bostonians speak well of the buckthorn, though we have never seen it assume any thing more than an ornamental appearance,—nothing like a barrier to cattle. We have planted the honey locust (*Gleditschia triantha,*) as a material to experimentt upon; and so far our confidence of success remains unimpaired: though we are not yet prepared to speak with confidence of the result. The best evidence of our confidence in it is furnished by the fact, that we have now a mile or two of hedge row of the plants growing, planted in four or five successive years. The principal fear is that it may grow too large,—an objection which will not apply so forcibly in Ohio, where land is abundant, and where the level nature of the country renders shelter desirable in winter. Yet we think, from our manner of training, the nearness of the plants, and by careful attention to clipping, when the growth of the hedge requires it, we can keep it within reasonable bounds. The honey locust, when cut in, does not throw out numerous shoots, like the thorn, but the principal growth is confined to a single stem. Our remedy for this defect is, to bend down and lay in the plant at a uniform height, when the stocks are from one to two inches in thickness, and to repeat laying the new growth every second or third year till the horizontal barrier is four to five feet high. The tops are wattled to the right and left alternately, of the adjoining plants; and if the top is not depressed below a horizontal position, it continues to live and grow, and sends up shoots from nearly its whole length. The hedge of course becomes firmer and stronger every year.

We will close our remarks by advising Mr. Lockwood and his neighbors, to collect without delay, haws or seeds of the indigenous thorns of their neighborhood, and seeds of the honey locust, which we believe is a native of their forests, and to sow them in the spring in beds of good earth. The first will not come up till the second year, and many seeds of the latter will not germinate in a shorter time. Keep the seed beds free from weeds, and after two years' growth, the plants will be fit to put in a hedge row; and if they continue to take the Cultivator, we promise to instruct our Ohio patrons in the subsequent management, should they require our aid. They may also collect in the spring, from the woods, plants of the thorn of any moderate size, say from the eighth of an inch to two inches thick, saw off the tops near the roots, and having prepared the ground well, make a trench on the site of a desired fence, and plant the roots one foot apart.

OLD-FASHIONED MERINO SHEEP.

I had occasion, in the last number of the Cultivator, to notice a lot of very beautiful South Down sheep, lately imported from England by F. Rotch, Esq. of Butternuts, Otsego county. I have since been favored with a view of twenty-one head of very superior "*old fashioned Merino ewes,*" destined to grace the valley and verdant hills of the Butternuts, whose fleeces, I was informed, averaged, last summer, four and a half pounds of clean wool each, besides giving a good lamb.

In October last, four bucks of the same description, whose fleeces weighed from 6¼ to 9½ lbs. each of good fine wool, passed through this city—two for Mr. Rotch and two for Judge P. Franchot of the same town.

These, I believe, are descendants from the famous breed of Merino sheep, first introduced into this country by the late Chancellor Livingston from France, and Col. Humphrey from Spain.

They are a more hardy and thrifty race than our native or Saxony sheep, as is acknowledged by every person who has kept a mixed flock, feeding together either on dry food or grass.

A valuable correspondent observes, in one of his letters to me, "sheep of the above description are now very scarce, and will soon be in great demand, for all wool-growers are aiming at small fine fleeces, whose constitutions will not stand severe wet and exposure to cold. The difficulty is already beginning to be felt, and nothing but a resort to the '*old-fashioned Merino*' will help it."

These sheep have been selected by a person well qualified to the task, and whose experience in sheep and wool has been very extensive; were procured at a very great expense—having travelled over

a vast extent of country—selecting some from one flock and some from another, until he collected a small but very superior flock, having in view, *fine quality* and *great quantity* of wool, united with a large and heavy carcass.

Hereafter, I presume, we must look to Mr. R. for the pure breed of "South Down" and "Merino sheep," as well as for the "Improved Durham Short Horned" cattle, of which he has a herd, equalled by few—surpassed by none; for he is a great stickler for blood and pedigree, even to his barn-yard fowls.

Mr. R. certainly deserves great credit, not only of the county of Otsego, but of this state, for his indefatigable exertions in procuring such animals; and we have every reason to hope and trust that he will be amply remunerated by a discerning community, for the very great expense he has already incurred.

I have now in my possession, and propose to give, in the next number of the Cultivator, a cut, exhibiting a very striking resemblance to one of the above bucks, in the form of "Don Pedro," with a short history of the same, imported by Mr. Dupont in 1801—then residing in the vicinity of New-York, and supposed to be the *first buck* of the pure *Merino* breed introduced into this country.

Albany, Dec. 1834. AMATEUR.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

I. SOILS.

III. *Properties of Soils as determined by their Vegetable Productions.*

When we regard the distribution of plants in different regions, we perceive that this is determined by causes which have little relation to the nature of the soil on which the plants grow. The soils of all countries are in their essential characters, alike. The same mineral masses, composed of the same substances, exist over all the world, and yield, by their disintegration or decomposition, the same materials for the forming of soils.

But, although the mineral matter of the soils of all countries is thus similar in its constituent parts, it is altogether different with the vegetation by which these soils are characterized. Every zone, from the equator to the polar circle, is distinguished by a different vegetation, and different regions have their peculiar plants. A district of granite, of sandstone, or trap, in southern Asia, will yield the same materials for forming soils as similar districts in northern Europe, while the vegetation produced will scarcely seem to possess any common character.

Amongst the natural causes which effect the vegetation of countries, the influence of temperature is that which is the most obvious to the senses. When we pass from a warm country to a cold, we perceive a change in the whole character of the vegetation. We cannot ascend a mountain without finding such a change in the kinds of plants produced, and in the vigor with which they grow, dependent upon the change of temperature. The degree of moisture, too, the distance or proximity of the sea, and other circumstances connected with the climate and physical condition of the country, affect the nature of its vegetable productions, and show that the influence of soil, with respect to the kinds of plants produced, is entirely subordinate to that of temperature and effects of climate.

When we extend, then, the range of our observation to different and distant countries, we see that the nature of the plants can not indicate that of the soils on which they grow. It is only within narrow limits, and under given conditions of climate, that the kinds of plants afford any indication of the nature of the soils which produce them.

Within certain geographical limits, however, as those of a country having throughout nearly the same climate with respect to temperature and humidity, useful rules may be given for distinguishing soils by means of the plants which they produce. Numerous species of plants, indeed, will grow, with equal readiness, on different kinds of soil; yet, there are other species which affect particular soils, and in their wild state do not grow on any other. Thus, there are plants whose natural habitat is peat, others which grow on soils charged with moisture, and others on soils which are dry; some which, under the like conditions of humidity and temperature, are proper to the light and silicious soils, some to the stiff and aluminous, some to the calcareous.

But, as even within the limits of a single country, pretty similar in its climate throughout, variations must exist of altitude, and, consequently, of temperature,—of exposure to particular winds, and, consequently, of humidity,—of proximity or distance from the sea, and other circumstances affecting the habitats of plants,—it is often difficult to indicate the precise nature of a soil merely by its prevailing vegetation. It is almost always possible, however, to determine from this circumstance, whether the soil be wet or dry, and whether it be fertile or infertile.

It is for the last mentioned purpose, namely, determining the character of a soil with respect to its fertility, that the examination of its vegetable produce is the most important in practice. The nature of a soil, with regard to its texture and composition, will generally be best determined by an examination of the substance itself. But its fertility, or power of production, may be judged of from its natural produce; in part from the kinds of plants which are peculiar to it, and in part from the luxuriance with which they grow.

When we cast the eye over a tract of country, we have generally little difficulty in determining whether this tract be barren or fertile. The general aspect of the vegetation, whether stunted or vigorous, the absence or presence of heaths, the richness of the sward, the cleanness and straightness of the stems of trees, the verdure of the foliage, and the like, present to the eye a general character not readily mistaken.

When we observe a tract covered with luxuriant grasses and other plants, and with vigorous shrubs and trees, we naturally associate these appearances with fertility in the soil itself. When, again, we see a tract of heaths or naked sands, with the plants small or sickly, the soil thinly covered with lichens, mosses, and other inferior plants, the eye alone is sufficient to indicate that the tract is absolutely or relatively infertile.

The same method of judging of the productiveness of the soil may be extended to a field or to a farm. Let us direct the eye over it, and its general character with relation to its vegetable productiveness, will impress us at once with an idea of its fertility or barrenness.

This conclusion, indeed, will not be so securely arrived at if the surface be limited to a single field, and still less if that field shall be cultivated; in which case effects of art, and the stimulus of cultivation, may disguise the natural characters of the soil. But if the range of our observation shall be so extended as to take in a sufficient number of fields and objects, as trees, shrubs, hedges, and natural meadows, we shall scarcely fail, if the eye be at all accustomed to country objects, to arrive at a tolerably correct conclusion as to the general character of the soil in respect to fertility; and our conclusions will be yet more satisfactory and precise, if we know the particular kinds of plants which thus give the character of infertility or productiveness to the soil.

The plants the most important in this species of examination are the heaths, the grasses, and other herbage plants. In the vast forests of the New World, the most common method resorted to by settlers for judging of the comparative productiveness of soils, is by observing the kinds of trees produced, whether pine, cedar, hickory, or oak. This is because the principal vegetable productions of these countries are wood. But with us, the principal vegetable productions are the heaths, the grasses, and other plants that form the sward. These may be said to cover the entire surface of the country when not extirpated by art; and they afford, accordingly, the readiest means which vegetable productions present of judging of the properties of soils.

The fertility of soils, generally speaking, is denoted by their power to yield the useful plants; and it is a law, with few exceptions, that the poorer the soil is, the less nutritious are the plants which, in its natural state, it produces. The soils of the poorest class produce mosses, lichens, and heaths, which are less nutritious than the grasses. As the soil improves in quality, the grasses become intermixed with the heaths, lichens, and mosses. But these grasses are still inferior and little nutritious. As the soil continues to improve, the grasses bcome more valuable in their kind, and more numerous in their species; and in like manner, the leguminous and other herbage plants indicate, by their kinds and greater numbers, the increasing fertility of the soil. A square foot of rich old turf has been found to contain 1,000 separate plants of twenty distinct species;* while a square foot of silicious sand will frequently contain not more than half a dozen distinct plants, and those of a single species.

In the northern latitudes of Europe, the plants most generally regarded as indicative of inferior soils are the heaths. Some of the species of this family characterize, in a peculiar manner, the soils

* Hort. Gram, Woburnensis.

termed peaty. They are found, too, abundantly, on the coarser clays or tills, on the poorer silicious sands, as those lying upon or derived from quartz, on the poorer class of calcareous soils, as chalk, and generally on all soils, low in the scale of fertility.

The soils where this kind of plant prevails, are frequently termed heathy soils or heaths. Heathy soils have, however, their relative degrees of productiveness, and this is generally well denoted by the vigor with which the heaths peculiar to them grow. Thus, a soil of stunted heaths may be regarded as among the lowest in the scale of fertility, whilst a vigorous growth of the plant, may indicate a soil susceptible of improvement and cultivation.

[We omit here the names of many plants which indicate the quality of the soil, as several of them are not found in the United States, and of those that are, little is known, by common readers, of their botanical or common names.]

Various plants are regarded as indicating fertility where they prevail. Of these are:—

1. Cnicus lanceolatus—Spear Plume-Thistle.
2. Urtica dioica—Great Nettle.
3. Arctium Lappa—Common Burdock.
4. Stellaria media—Common Chickweed.
5. Achillea Millefolium—Common Yarrow.

And, generally speaking, all the richer and more nutritious pasture grasses. Such are:

1. Dactylis glomerata—Rough Cocksfoot.
2. Festuca pratensis—Meadow Fescue.
3. Alopecuris pratensis—Meadow Foxtail.
4. Poa trivialis—Rough-stalked Meadow-grass.
5. Phleum pratense—Meadow Catstail.
6. Lolium perenne—Ryegrass.

Those who desire to pursue this investigation more in detail, may consult botanical works descriptive of the plants of particular countries or districts, in which they will find the habitats of plants indicated with more or less correctness. It is not necessary, in the present place, to extend the observations on this subject; for in giving examples of plants, those have been selected which are of frequent occurrence, and the best suited to indicate the characters of soils in this country.

I shall now conclude the subject of soils, by giving the student a few rules for enabling him to distinguish soils in the situations in which they may be presented to him.

First, then, let him make such use of the indications afforded by the natural produce of the soils as his means of information afford. He may not know the names of the plants that are growing naturally upon the surface, but he can always observe whether they are growing with vigor, whether the sward is thickly covered with species, and whether the general aspect of the part to be examined indicates fertility or poverty.

A difficulty, which it will be well that he endeavor, in the first place, to overcome, is to distinguish the peaty soils from the earthy. He will experience little difficulty in this, when they are distinct from each other, and covered by their natural herbage! But when they are subjected to cultivation, or intermingled with the earthy soils of the same field, or when a soil contains a certain portion of peat in its composition without being entirely peaty, then the eye may be deceived, from their resemblance to the dark coloured loams. The one class of soils, however, may be of great fertility, and the other of great barrenness; for it is to be observed that, though peat may be often rendered fertile, its presence in soils is always suspicious.

The soils termed peaty, it was before observed, are dark in their colour, and loose and spongy in their texture, even when improved by art. The soils which they most resemble in external characters are the richer loams, but they are more light and spongy than these, and their colour is of a duller dark than the loams, which approach rather to a hazel hue. Peaty soils, too, very generally lie on a retentive subsoil; but perhaps the best method of discriminating them in the absence of their peculiar vegetation, is by the stones which lie upon their surface. These appear to be acted upon by the acid matter of the peat, and present a white appearance, which, when once observed, will not be easily mistaken again. Coupling this indication with the dull black, as distinguished from the brighter hazel of the loam, and above all, with the peculiar vegetation and sterile aspect of the surface, the student will soon learn to distinguish the peaty soils from the earthy.

In examining the earthy soils, an essential circumstance to be regarded is, the depth of the soil, and the texture of the subsoil. A medium depth of a soil may be held to be from nine to ten inches. But it will be better that it exceed a foot, and this greater depth of the soil is always a favorable indication. If the depth of the soil does not exceed six inches, that is an unfavorable indication. Such shallow soils are rarely good, except sometimes when they occur resting on peculiar rocks, as compact limestone, and certain easily decomposed basalts and porphyries. If a shallow soil shall occur on a retentive clay, or on silicious sand, we may certainly pronounce it to be bad. When in the common operations of tillage the plough is constantly turning up a subsoil very different in colour from the upper stratum, that is an unfavorable indication.

When we find the rain in a furrow of ordinary descent carrying off the soil, and leaving the subsoil exposed, that is an unfavorable indication. It is desirable to see the water in the furrows sink down and be absorbed, instead of carrying of the surface soil.

If the soil be of a dull black colour, and if it present upon the surface the white stones above refered to, that is an unfavorable indication, as it shows that the soil has more or less of peat in its composition.

If the soil produce sub-aquatic plants, it is wet. If we find that such a soil is peaty, or shallow on a retentive subsoil, it is naturally sterile. If we find that the sub-aquatic plants are tall and vigorous, and the soil earthy and deep, the removal of the wetness may remove the cause of infertility, and such a soil may become of the richest kind.

If we find a soil producing naturally the superior herbage plants, and of a good depth, that soil we may infer to be good. When soil of this kind tends to a dark hazel colour, we may safely reckon it among the superior soils.

By attention to these rules, and by a little observation and practice, the difficulty of discriminating soils will gradually be lessened, and at length disappear. Those who have been used to country objects rarely experience difficulty in discriminating soils, in so far at least as these soils are to be distinguished by their texture into stiff and free, or by their powers of production into rich and poor.

Sheep Husbandry.

HINTS ON SHEEP HUSBANDRY.

[*Selected and collated for the Cultivator.*]

In an agricultural view, simply, the importance of sheep is extreme; since, by their assistance alone, thin barren, upland soil, so often the far greater part of a country, can be cultivated to advantage, which otherwise could not generally be cultivated at all. The sheep will subsist and multiply on those barren soils where no other animal would be maintained with equal profit; he is equally calculculated for the most deep and fertile, challenging competition, and dividing the palm of profit with the ox, and is excluded from such only as abound in stagnant water, the moist exhalations of which are naturally destructive to his constitution.—*Lawrence on Cattle.*

The bodily constitution of the sheep, as of the goat, the deer, the camel, the hare and the rabbit, is usually called hot and dry; we however know from unquestionable experience, that dry soils, a dry air, dry provender and green food, which does not abound in cold and watery juices, are most appropriate and salutary to them. Indeed the contraries are replete with danger to the sheep, most particulary, which is naturally and constitutionally subject to serous effusion, producing a dropsy of peculiar kind, either universal or circumscribed, but more usually the latter, extending indifferently to all parts of the body. This efflux of water, or rather watery tendency, in all the fluids of the body, gradually produces in the solids disorganization, mortification or rot. Catarrhal affections are the most usual primary causes of rot. These ideas very plainly indicate the proper situations, food and treatment of sheep.

Sheep have often been described as of "a weakly constitution, liable to be exhausted by fatigue, and ill able to bear the extremes of heat and cold, subject to many diseases, most of which are contagious." Such notions are to be received with much allowance, for in truth this useful race seems enabled by nature to accomodate itself to all the vicissitudes of climate, and to nearly the extremes of heat and cold, of which the husbandry, ancient and modern, of both northern and southern countries forms the best proof. We see them accustomed to brave the most rigorous of these extremes un-

hurt, liable, as might be expected from the nature of the case, to casualty and loss, which timely shelter might prevent. The sheep well fed, from its fleecy covering and gregarious habits, whence results an atmosphere of considerable warmth, remains very little affected by intense cold, if unaccompanied by moisture; he is perhaps more unfavorably affected by great heat, but continues safe under either extreme, with the advantage of sufficient shelter, obviously one of the most important points in the sheep husbandry. The various diseases incident to sheep have their origin almost exclusively in neglect, improper situations and treatment, or errors in feeding. Reverse these, and diseases among sheep would be as few and rare as they are now numerous and rife throughout our sheep districts; another grand point in their husbandry.—*Ibid.*

One of the two species of sheep, the long and the short woolled, having been chosen, as most appropriate to the situation, and wool being made an object, it is most advantageous to select such flocks as are pure as possible of the species to which they belong, and not a mixture of the short and long wool breeds, which must generally produce an inferior fleece, disadvantageous to the manufacturer.—Length of staple in the long, and fineness, elasticity and closeness in the short woolled fleece, will be the best guides in this case.

Whether the wool be long or short, the carcass of the animal ought to be amply and regularly covered; it is a great defect when the belly is bare, and a still greater when the wool is thin and open along the ridge of the back, admitting rain and moisture to a most susceptible part; indeed to descend upon all parts of the body.

It is a piece of good old advice to buy your *rams* a little before shearing time, if possible; and a very necessary modern addition to take the opportunity of purchasing at the farmer's house, whilst you can see the animal in *paribus naturalibus*, and before he has been decked out and trimmed for show by the sheep barber. A thick fleece, covering all parts with as much equality as possible, containing plenty of *yolk*, or retained or inspissated perspiration, is the object. If ewes, equally well bred, can be procured, the shepherd anticipates and reaps an immediate benefit; if not he must patiently await improvement of his wool, through the medium of the superior blood of his rams.

At *shearing time*, examine the bottoms of the fleece, or the lower extremity of the filaments of wool; if it be *stichy haired*, of mixed quality, or if the sheep have a coarse breech, or be not well covered, it must be rejected, as improper for a breeding stock, where it would perpetuate its defects. The quantity of yolk or grease is a good proof of the thickness of the fleece, since, by the closeness and thickness of the wool, the grease or perspirable matter of the animal is retained; hence fine, closed, curled wool has ever the greatest quantity of yolk.—*Bath papers.*

Dentition is commenced and is completed early with the lamb, and I have, within these few hours examined the mouth of one three months old, which has its complement, eight small or lambs' teeth. Two of these, in front, fall and are replaced by two broad or sheep's teeth, at some period previous to the sixteenth month, sometimes, although rarely, within the first year. A similar renewal of two teeth takes place every succeeding year, until towards the end of the third, sometimes during the fourth, or in the commencement of the fifth year, when the sheep is full mouthed or aged, having acquired the eight broad teeth.—*Lawrence.*

Markham advises to "choose your sheep the *biggest boned*, with the best wool, the staple being soft, greasy and well curled, and close together, so that a man shall have much ado to part it with his fingers. These sheep, besides bearing the best burden, *are always the best butcher's ware, and go soonest away in the market.* The *ram* large of body, in every general part, with a long body and a large belly his forehead broad, round and well rising, a cheerful large eye, straight short nostrils, and a very small muzzle, by no means any horns for the dodder, [hornless sheep] is the best breeder, and his issue never dangereth the dam in yeaning as the horned sheep do. A large upright neck, somewhat bending like the neck of a horse, a very broad back, round buttocks, a thick tail and short jointed legs, *small, clean and nimble;* his wool should be thick and deep, covering his belly all over; also his face and even to his nostrils, and so downward to his very knees and thighs."

Cully's description of the ram.—"His head should be fine and small, his nostrils wide and expanded, his eyes prominent and rather bold and daring, ears thin, his collar full from his breast and shoulders, but tapering gradually all the way to where the head and neck join, which should be very fine and graceful, being perfectly free from any coarse leather hanging down; the shoulders broad and full, which must, at the same time, join so easy to the collar forward, and chine backward as to leave not the least hollow in either place; the mutton upon his fore arm or fore thigh must come quite to the knee; his legs upright, with a clean fine bone, being equally clear from superfluous skin and coarse hairy wool, from the knee and hough downwards; the breast broad and well forward, which will keep his fore legs at a proper wideness; his girth or chest full and deep, and instead of a hollow behind the shoulders, that part by some called the fore flank, should be quite full; the back and loins broad, flat and straight, from which the ribs must rise with a fine circular arch; his belly straight, the quarters long and full, with the mutton quite down to the hough, which should neither stand in nor out; his twist [the junction of the inside of the thighs] deep, wide and full, which, with the broad breast, will keep his fore legs open and upright; the whole body covered with a thin pelt, and that with fine, bright soft wool."

Marks of excellence in long or short woolled sheep. Fleece white (tinged with a red brown hue, if Merino) palate, with the bridge of the nose, horns and hoofs white. No cat's hairs. The horns wide set, otherwise the head liable to the danger of contraction. Yet wide-headed horned lambs are dangerous to the ewes in yeaning. It is said the horns may with safety be twisted off when the lamb is only a month old.—*Lawrence.*

South-Downs.—The number of ribs in a sheep is thirteen. Average weight of tallow from 12 to 16 lbs. exclusive of kidney fat. The finest woolled fat, are fit for market six weeks or two months sooner than the coarsest; and in proportion to the fineness of the wool they succeed each other. The grain of the flesh is in proportion to the fineness of the wool, and the carcass of a fine woolled sheep will considerably out-weigh that of a coarser woolled sheep of equal size and dimensions. If well kept, the ewes will produce more than one lamb, instances not being wanting of the production of five at a birth, but in such cases more than two of them are seldom saved. The coarsest woolled ewes bring lambs with the greatest quantity of wool upon them at the fall.—*Mr. Alfrey, in the Annals of Agriculture.*

The signs of health in sheep are, first, a skittish briskness, clear azure eye, florid ruddy eye-strings and gums, teeth fast, nose and eyes dry, respiration free and regular, feet cool, dung substantial, wool fast and unbroken, skin of a fine florid red, particularly on the brisket. Sheep are often seen in market with nose and eyes running, or, as we should say of a horse, almost glandered. This happens from wet layers, during their travel, in cold, windy seasons; and a continuance of such weather, and perhaps after neglect, lay the foundation of diseases which, afterwards, the cause is not suspected. Great caution is necessary during drift, [driving] that the flock be not suffered to rest on wet and boggy layers, and that they are provided with dry lodging, and sufficient keep to support their strength.—*Lawrence.*

Folding sheep.—The advantages supposed to be derived from it are visionary; being in fact no more than robbing a large part of a farm to enrich a small one. Large flocks, even any number, kept together above one hundred, is a barbarous practice; for in such flocks the strongest will beat the rest from their food; instead of which, the weakest sheep should have the best food; and if folding is necessary on farms that have no commons annexed to them, why not have small folds on different parts of the farm, and for those of different kinds, ages or strength, and thereby save the trouble of driving from one part of the farm to another? for had not the animal, after it has filled its belly, better lie down and sleep, than travel to create an appetite? From my general observation in various parts of the kingdom where folding is, and is not practised, my opinion has been confirmed; nor will I allow any utility to the fold, excepting, perhaps, in the case of a flock feeding on large open commons by day, and considered in the light of mere dung carriers to the arable land.—*Bakewell.*

Covered folds.—In Essex, it is common for the farmers to fold their sheep in covered folds, and mix their dung with ditch earth, mud, &c. which causes the dung to spread and go much farther. In Gloucestershire, &c. the farmers house their sheep at night, and litter them with straw, and when one quantity is converted into soil, they add fresh, so that a whole winter affords a great quantity of dung where a large flock is kept, and it is found, by long experience, to answer the trouble; so that by folding in summer, and housing in

winter, all their dung and urine are preserved for the land in tillage. —*Mordant.*

It seems to be admitted on all hands, that if sheep are yarded, they should be supplied with dry litter, both because it is essential to their health, and that this litter absorbs and saves the urine, essential to the increase of manure; and it is no less essential, that the location of the sheep pen should be a dry one. A free circulation of air, though cold, is not so prejudicial to sheep, if they are protected from wet, by a sufficient covering.

Miscellaneous.

[*From the Edinburgh Quarterly Journal of Agriculture.*]

ON UNDER-GROUND DRAINING.

Most occupiers of land are fully aware, that the first and greatest improvement of wet land is draining; but they do not agree as to the most proper means for effecting that desirable object. So much depends upon soil, subsoil, and other localities, no positive rules can be given for the draining process. Experience is the best guide, and the tact or art of effecting the most good at the least comparative expense, can only be acquired by extensive practice, close observation and correct calculation. Hence young practitioners frequently commit great errors, lose much valuable time, and expend large sums of money to little good purpose. But although no positive rules can be given, a few general remarks and practical hints from an old drainer may be of service to the inexperienced; and with that view the present communication is made, by one who has had long and extensive practice in land-draining. As the writer does not pretend to advance any thing new on the subject, his remarks may not be interesting to old practitioners; but as he will endeavor to point out prevalent errors, with instructions for improvement, he is not without hopes his efforts in that way may be of some service to young beginners; and to such he begs leave to address himself.

Extensive bogs are usually drained under the direction of professional scientific men, and any criticism upon their operations would be superfluous in this place. Neither will it be necessary to remark upon open or surface drains, ditches or water furrows, as these are generally well executed by attentive farmers; but under-draining of springy land in all its variety of broken measure, and upon other land retentive of wet, though carried to a great extent by farmers and other land occupiers, is not generally so well conducted by them as surface draining. The following remarks will therefore be confined to under-ground or covered drains, commencing with those usually called

Furrow-drains.—Much injury has been done and serious loss sustained, from the imprudent practice of levelling and straightening high crooked ridges upon retentive subsoil, without taking the precaution of draining the furrows in the first instance. In such cases, the only sure remedy is, by opening the ground in the lines of the old furrows, and putting covered drains into them. Cross-drains do not effect so perfect a cure as furrow-drains, upon land so mismanaged.

In setting covered drains of every description, whether with tile, stone, brushwood, turf, or any other material, particular attention should be paid to securing an open space at the bottom of every drain for a water-channel. Many farmers are not aware of the propriety of that measure, and others too negligent to attend to it. They fill their drains with stones or other material, thrown in promiscuously; those are called rubble drains; and the farmer feels satisfied of their efficacy, because he sees water oozing out at their ends. It is true water percolates through the material in the rubble-drains, but at different levels, seldom at the bottom, and sometimes at the very top of the rubble; consequently they are entirely deceptive in effect. Any person entertaining a doubt on the subject, may readily satisfy himself, by opening a short space by the side of a rubble-drain in wet-weather. He will then see the water issue out of the rubble, and rise in the opening, before he has dug near to the bottom of the drain—a clear proof it does not work well, and that the water, being so obstructed in its course, stagnates in the drain, and saturates the adjoining land. Whereas, had the drain been set open at bottom, the water would have had a free passage, and the land been relieved from superfluous moisture. Obvious as this must appear to every unprejudiced person, it is quite surprising with what tenacity some farmers, even at the present day, maintain a contrary opinion. The writer of this article has frequently met with such instances of perverseness, nor could he by any means induce the sceptics to prove the fact by the simple means here recommended. The advocates of rubble-drains argue—"That water runs out at the ends of such drains, which is quite sufficient; and that, were they set their drains open at bottom, rats and moles would creep into them, and stop them up." Without doubt, such vermin do occasionally creep into drains, but are not likely to stop them up, as they will not lodge in a water course. But even if they did so, the stoppage could only be temporary, for the water in the drains would rise up to the level of the loose material, above the tiles or set stones, percolate between them, and drop into the drain below the obstruction, which would soon be washed away, and the water-course be again left clear.

Tiles, properly made and well burned, are not only handiest, but the best material for setting in the bottoms of drains. They insure a clear water course. A drain two feet deep, set open at bottom, is more effective than one four feet deep filled with rubble, and is not half so expensive. Small stones, or other loose rubbish, should be laid above the drain tiles, or set stones, to act as conductors of wet. In most cases, about one foot deep of such material is thought sufficient. Some farmers fill their drains with small stones and other rubbish, so high, that the ploughshare touches the material in its operations; and the farmer thinks it indispensably necessary the drains should be so filled, under an idea that the top-water would not find its way into the under-drain by any other means. That is a bad practice, prompted by error in judgment, and effected at great unnecessary expense.

It is quite obvious, where the ploughshare disturbs the material in under-drains, it opens a passage for surface water into the drains; but the advocates of this measure should recollect, that water so admitted into a drain carries much earth with it, and soon chokes the drain up. Surface water will find its way into under-drains without the aid of the ploughshare. An old draining adage says, and says truly, "If *one* drop of water finds its way down, *two* will assuredly follow." When water is drained off at bottom, it gives place to moisture descending from above. "You cannot put more liquor into a barrel already full of it; but draw from the tap-cock, you may then pour into the bung-hole." These sayings, though homely, are applicable to the case in point.

The operation of opening furrow-drains is greatly facilitated, by commencing with a common plough, going once about, and throwing out a good furrow on each side. Two cuts or grafts with the spade, will then, in most cases, be a sufficient depth. The curved grafting tool is more effective in cutting out strong subsoil than the common garden-spade. A conic-shaped grafting tool answers best for cutting out the bottom drain. Furrow-drains should be cut narrow, the bottom of just sufficient width to receive the drain tiles. When the cutting is finished, the loose earth should be carefully cleared out of the bottom, with a scoop made for the purpose. Great care and attention should be paid to setting and filling the drains. The tiles being laid in a line along the side of the drain, the workman stands in the bottom of the drain, having one foot placed immediately behind the other. He reaches one tile at a time, and lays it firm on the bottom before him; he then moves his feet back, places another tile, and so on to the end of the drain. Small stones, or other loose rubbish, are then put over the tiles, and a layer of turf or sprinkling of litter is put over the rubbish, to prevent the earth sinking among it. Where no small stones or other loose rubbish can be procured to lay upon the tiles, turf or litter should then be laid immediately above the tiles, and the drain be filled up with surface soil, that being generally more porous than clay or tile dug from the bottoms of drains. Horses should not be allowed to tread upon new made, shallow-covered drains; neither should cart-wheels pass along or over them.

When furrow-drains are intended to be set with stones, it is not necessary, in all cases, to cut the drains so wide at bottom, as to admit of stones being set square on the sides, and have broad coverers placed over them as in deep drains. Stones may be set to give a free water course, in drains cut as narrow at bottom as for drain tiles. The workman places himself in the drain in the same form as when laying tiles, and the stones intended for setting being laid along the side, he reaches them as required. There are various methods of setting stones in the bottoms of narrow drains. One only shall be described here. It answers best in strong clay. The drain being five inches wide at bottom, place one end of the set stone in the angle at the bottom on one side, and lay the other end against the opposite side of the drain; the set stones being eight or nine inches long, will

then leave a clear triangular-shaped aperture for a water-course at bottom. The workman then selects other stones, and places them above the first setters, so as to form another triangular opening on the opposite side of the drain, thus forming a secondary water-course, if the first should be either obstructed or overcharged with water. Small stones are then put over the set stones, and the drain finished in the same manner as in tile-draining.

Shallow under-drains in the alignment of the ridges, called furrow-drains, are more effective than deep cross-drains upon strong land, impervious subsoil, and where there are no springs, spouts, or oozings of water from broken or irregular measures in the land.—The depth of furrow drains should vary according to the nature of the soil, and other circumstances; average depth about two feet; and, as before observed, they should be cut narrow.

Furrow-drains should not be formed to empty singly at the bottoms of open ditches, as they would be liable to be choked up by treading of cattle, and accummulation of weeds and rubbish in the ditches. It is a better plan to collect a number of furrow-drains into larger and deeper cross under-drain, made at a distance from the lower parts of the fields. Those receivers discharge the collected waters into open ditches or water-courses, and are not so liable to be choked up as furrow-drains emptying singly. Those receivers should not be made to discharge the water at the *bottoms* of open ditches. The water should be made to fall from one into the other, as will be more fully explained in the next section, when treating of

Deep Cross-Drains.—Cross-draining is more difficult than furrow-draining, and great errors are frequently committed in the practice. It is customary, in this description of draining, to commence operations at the lowest parts of the field, and where there are no side ditches for the cross drains to discharge into. A main, or leading drain, is carried up from the lowest to the highest level. The depth of the drains is generally settled in the first instance, without previous investigation of the nature of the soil and subsoil. As the main drain is under operation of being carried up the field, numerous cross-drains are made to lead into it. Those are frequently cut in straight lines, as that suits the workman's convenience, and sometimes at regular distances, whatever the nature of the soil or subsoil may be. In this manner a cure is sometimes effected, though at a great unnecessary expense. But the result is more generally a total failure, when the occupier consoles himself under his disappointment, with a belief that the failure was entirely owing to the nature of the soil, and impediments in the locality of situation, which could not possibly be overcome.

An experienced drainer, professional and practical, proceeds with greater circumspection in his operations, and he seldom fails of success; he, in the first instance, takes a minute view of the field to be drained; he inspects all the spouts or breakages of water in it; he decides upon the different levels of the ground, and facilities for carrying the water off; he then sets down his marking sticks for the workman's direction, not always in straight lines, but bending round the inequalities of the ground, and immediately above where the water spouts or oozings shew on the surface; he then takes other views of the lines of stakes, to satisfy himself the water in the drains will have proper falls, and when he entertains a doubt on that point, he proves it by the spirit level. These preliminaries settled, he ascertains the nature of the subsoil, by digging holes in the lines of the projected drain. These shew the strata in which the water flows, and the nature of the obstruction which forces the water up to the surface of the ground, and the depths of the drains is regulated accordingly. The digging of try-holes, technically called "feeling the way," is a simple and safe process, and should never be dispensed with where there is variation in the stratification.

In some fields, where the soil and subsoil vary in texture, and are irregularly disposed, springs as oozings of water, though they appear on the surface at various levels, not unfrequently arise from the same source, near the top of the field. Where the water issues from crevices in rocks, from loose gravel, or from other broken or loose measure, or alluvial deposite, the water filters through such measures, until obstructed by impervious subsoil. It is then forced up to the surface over which it runs in the declivity of the ground, and when it reaches more porous subsoil, it sinks into it, percolates through it, until it again meets obstruction, and is forced up to the surface, and forms the second line of water breakages; and a third and fourth line of these water-spouts may be formed from similar causes in the same field. These receive the several local appellations of springs, spouts, oozings, sloughs, quagmires, &c. In a field so circumstanced, it is advisable to cut the upper cross-drain in the first instance. It should be cut immediately above the first breakage of water near the top of the field, and be made to discharge into a side ditch, or into a leading drain, carried up for the purpose of a receiver. The effect of that cross-drain will be proved in one year, and when found necessary, other cross-drains may be cut at lower levels in subsequent years. It is frequently seen, where the draining operations are commenced, by cutting cross-drains at low levels; such drains collect, and discharge a great deal of water in the first instance; but when other cross-drains are afterwards cut at higher levels, the first are laid entirely dry, and the money which had been expended in making them lost, without rendering any benefit to the land; it is therefore advisable to cut an upper cross-drain first, prove its effect, and then proceed with the others at the lower levels, as may be deemed expedient.

The bottoms of drains, when not cut deep enough, are sometimes soft and poachy, and the draining material liable to sink into the mud. In such cases plain tiles, or flat stones, should be laid in the drain bottoms for the drain tiles, or setting stones to rest upon. And in quagmires, or loose running sand, it is advisable to drive short wooden piles into the drain bottoms; those ensure good foundations, however soft and poachy the subsoil may be.

It may be thought unnecessary to again mention the propriety of securing open water courses at the bottoms of covered drains. But that is a leading principle in draining which cannot be too frequently inculcated, nor too positively insisted upon, and it is of still greater consequence in deep drains than in shallow ones.

When water springs up in the bottoms of drains, it indicates obstruction at lower levels. The boring rod should then be applied, to give vent to the pent up springs. Every extensive drainer should be provided with a light boring rod, called a "churn-drill." It is made of round bar-iron, half inch diameter, and about eight feet long; the ends beat flat into chisel form, one inch broad, and steeled. In using the churn-drill, the workman stands in the drain; he holds the rod upright with both hands, raises it up perpendicular and drops it into a hole in the bottom of the drain; and at every movement, shifts his hands, and in so doing he turns the rod a little, so as to make the bore hole round, and prevent the chisel wedging in the hard substratum. In working this implement, the motion is something like that of the stick or handle of an upright butter churn, and hence its name. When the bottom is dry, as is sometimes the case before the springs are tapped by the rod, the bore hole should be kept moist by pouring water into it. The churn-drill, though simple, is powerfully effective when properly applied in boggy or springy ground, and frequently saves the expense of cutting additional drains. The great boring-rod, with its appendages, is still more effective, but it is too complicated, and too expensive for common use in land-draining, and is only used in extreme cases.

Some persons who think it necessary that cross drains should have rapid falls, cut them in straight lines at considerable declivities, and by that means frequently miss the water-spouts they intended to cure. This is a great error in practice, for it is by no means necessary, nor is it at all times prudent, to give water in under-drains a rapid fall, particularly in loose subsoil, liable to gutter and sludge up. The bad effects of rapid falls for water, are exemplified in arable land furrows, and other surface drains on hilly land. These are frequently sludged up in heavy rains, the water is thrown over the surface, and its current diverted into other channels. Attentive farmers, therefore, make cross-furrows or drains, with easy falls, to collect and carry off, without injury to the land, the surplus water from the furrow-drains. The same rule applies, and similar precaution should be taken, wherever there is expectation of much water in under-drains. It is not necessary to cut cross-drains in straight lines. They may be made to bend in any direction, to cross the water-spout intended to be cured. But care should be taken in cutting, not to lose the water level in any one place. The workman readily guard against that error; he has only to see that the water in the bottom of the drains runs from him, and does not come back among his feet.

It has been heretofore remarked, that under-drains should not be made so deep as to discharge the water *at the bottoms of open ditches*, but should have a fall into them, for the purpose of preventing their choking up, by the treading of cattle or otherwise. Many farmers commence their draining operations by cleaning out and deep-

ening the open ditches into which they purpose the covered drains to discharge. The object of that deepening is, to get additional fall for the water from the drains. The design is good, and would answer the intended purpose, if those ditches were regularly cleaned out afterwards; but unfortunately that is seldom or never the case, for the farmer's attention being called to other important concerns, the drains being out of sight, are soon out of mind, the ditches are neglected, leaves, coarse grass and other rubbish accumulate in them, cattle get into them and poach them up, and the mouths of the drains are stopped up; the water stagnates in them, and the land again becomes saturated with wet. It is therefore not advisable to gain fall for covered drains by deepening open ditches, when it can possibly be obtained by other means.

Cross drains should not be made to join the receivers, whether open ditches or covered drains, at right angles or nearly so, as they generally do. Neither should they be cut so deep by some inches, as the receivers; and with a view to ensuring a free discharge of water from the cross drain into the receiver, it is advisable, at a point a few yards distant from where the junction would be formed in the usual way, to give the cross drain a sharp bend towards the declivity of the ground, and make it join the receiver in an acute angle, as it then would do at a lower level. This practice ensures a good fall, and prevents choking up, as the weight and force of water from the bend of the drain effectually removes observation at the point of junction, and keeps the mouth of the drain open.

F. B.

[*From the Northampton Courier.*]

CHINESE MULBERRY.

The Secretary of the Hampshire, Franklin and Hampden Agricultural Society, furnishes us with the following facts in relation to silk worms and mulberry trees:

At the late show of the Hampshire, Franklin and Hampden Agricultural Society, Elizur Goodrich, Jr. Esq. presented a claim for premium on white mulberry, set on his farm in Montgomery, in the county of Hampden, and obtained the first premium. He states that in 1833, he had 9,000 mulberry trees set on one acre—the rows 4 feet apart and trees 12 to 18 inches apart in the rows. In 1834, had 20,000 mulberry trees set on three acres—the rows six feet apart, and trees 12 to 18 inches apart in the rows—also 9,000 mulberry trees set on 4 acres, the rows 6 feet apart, and trees 3 feet apart in the rows; that he planted potatoes between the rows, had a good crop, and found the cultivation of the potato was advantageous to the mulberry trees. Expecting to use the leaves in the manufacture of silk, he intends to keep the trees cut down to six or eight feet, for the convenience of gathering leaves. The trees are from three to four years' old and very thrifty.

Mr. Timothy Smith of Amherst, in the county of Hampshire, also presented his claim for premium on the white mulberry, and obtained the Society's premium. He represents that he has 17,443 white mulberry trees, of which 3,638 are set out on about 100 rods of ground in rows 8 feet apart, and the trees 2 feet apart in the rows, the residue set more compact for the purpose of topping to feed worms. He planted potatoes between the rows, had a great crop, and found the hoeing among the potatoes was beneficial to the mulberry trees. From the experience he has had in feeding worms, calculates that half an acre set with white mulberry will produce feed for 100,000 worms—says he has what he considers five species of worms, viz. the black annual worm, producing *one* crop in a year of *yellow* cocoons, also the black worm producing *two* crops in a year of *yellow* cocoons, the grey worm, the large white and the small white worm, producing two crops in a year of *white* cocoons. The present year has fed only about 30,000 worms, but thinks his mulberry trees might give sufficient feed for an *hundred thousand worms*.

He had worms on feed when the late severe frost came, and gathered a quantity of leaves while frozen, packed them in a sack which had been used for salt: in this state the leaves were kept green and in good condition, so that he fed his worms two weeks with them and the worms devoured them with the same avidity as before they had been frozen.

The frost completely destroyed the leaves remaining on the trees. Mr. Smith now thinks that leaves may be preserved through the winter, for winter and early spring use. He has 357 promising seedling plants of the Morus Multicaulis, the product of one paper of the Chinese mulberry seed which he had of the society last spring. On this subject, the committee would remark, that from the source and peculiar circumstances under which the seed was obtained from the interior of China, it is believed to be genuine, and not improbably, the first good seed imported. The seed has been distributed into several towns in the county and generally given a good return, unless when planted or sown too deep. Some seed, however, was lost, and did not vegetate in consequence of sowing too deep. The most favorable depth is about one quarter of an inch, regard being had to the soil.

The seedlings of the present year, standing some distance from each other, gave out side branches, some of which as an experiment, were made into cuttings, set in the ground with one bud exposed, and did well, although done in a very dry and hot season, and while the branches were green and tender. Some seedlings of the present year produced leaves measuring 9¼ by 8¼ inches before the severe frost, and had the weather continued mild a few weeks longer, it is thought some leaves would have attained the size of 12 to 14 inches. Some seeds were sent northerly and southerly to a considerable distance, and one parcel to the distance of 5 or 600 miles, and did well. Should no more be received from China, there is now a sufficiency of grown trees and seedlings in such forwardness as in a short time to supply the whole limits of the society with the real Morus Multicaulis.

[*From the Library of Useful Knowledge, Farmers' Series.*]

PHYSICKING HORSES.

This would seem to be the most convenient place to speak of physicking horses, a mode of treatment necessary under various diseases, but which has injured the constitution of more horses, and in fact absolutely destroyed more of them, than any other thing than can be mentioned. When a horse comes from grass to hard meat, or from the cool open air to a heated stable, a dose of physic, or even two doses may be useful to prevent the tendency to inflammation which must be the necessary consequence of so sudden and great a change. To a horse that is becoming too fat, or has surfeit, or grease, or mange, or that is out of condition from inactivity of the digestive organs, a dose of physic is often most serviceable; but we do enter our protest against the periodical physicking of all horses in the spring and the autumn, and more particularly against that severe system which is thought to be necessary to train them for work, and the absurd method of treating the horse when under the operation of physic.

A horse should be carefully prepared for the action of physic.—Two or three bran-mashes given on that or the preceding day are far from sufficient, when a horse is about to be physicked, whether to promote his condition or in obedience to custom. Mashes should be given until the dung becomes softened; a less quantity of physic will then suffice, and it will more quickly pass through the intestines, and be more equally diffused over them. Five drachms of aloes, given when the dung has been thus softened, will act much more effectually, and much more safely than seven drachms, when the lower intestines are obstructed by hardened fæces.

On the day on which the physic is given, the horse should have walking exercise, or may be gently trotted for a quarter of an hour twice in the day; but after the physic begins to work, he should not be moved from his stall. Exercise then would produce gripes, irritation, and possibly dangerous inflammation. The common and absurd practice is to give the horse most exercise after the physic has begun to operate.

A little hay may be put into the rack; as much mash may be given as the horse will eat, and as much water, with the coldness of it taken off, as he will drink. If, however, he obstinately refuses to drink warm water, it is better that he should have it cold, than continue without taking any fluid; but he should not be suffered to take more than a quart at a time, with an interval of at least an hour between each portion.

When the purging has ceased, or *the physic is set*, a mash should be given once or twice every day until the next dose is taken, between which and the *setting* of the first there should be an interval of a week. The horse should recover from the languor and debility occasioned by the first dose, before he is harrassed by a second.

Eight or ten tolerably copious motions will be perfectly sufficient to answer every good purpose, although the groom or the carter may not be satisfied unless double the quantity are procured. The consequence of too strong purgation will be, that a lowness and

weakness will hang about the horse for many days or weeks, and inflammation will often ensue from the over-irritation of the intestinal canal.

Long continued custom has made aloes the almost invariable purgative of the horse, and very properly so; for there is no other at once so sure and safe. The Barbadoes aloes, although sometimes very dear, should be alone used. The dose, with a horse properly prepared, will vary from five to seven drachms. The preposterous doses of nine, ten, or even twelve drachms are, happily for the horse, generally abandoned. Custom has assigned the form of a ball to physic, but good sense will, in due time, introduce the solution of aloes, as acting more speedily, effectually and safely.

The only other purgative on which dependance can be placed is the croton. The farina or meal of the nut is used; but from its acrimony it should be given in the form of ball with linseed meal. The dose varies from a scruple to half a drachm. It acts more speedily than the aloes, without the nausea, which they produce; but it causes more watery stools, and consequently more debility.

Linseed oil is an uncertain but safe purgative, in doses from a pound to a pound and a half. Olive oil is more uncertain but safe; and castor oil, that mild aperient in the human being, is both uncertain and unsafe. Epsom salts are inefficacious, except in immense doses of a pound and a half, and then not always safe.

RAISING DUCKS AND TURKEYS.

In the *Agriculturist* of last year appeared two articles, one on the best mode of raising ducks, and the other on turkeys, Two seasons have since passed away, and the writer of this has been enabled to test the efficacy of those directions; and in every instance that has come under his knowledge, they have been attended with perfect success. The direction for raising ducks, were to feed them on animal food and keep them dry. Individuals who have adopted this plan, have sent to our markets from 500 to 700 ducks of the finest kinds, and they have had no diseases among them, and found no difficulty in raising them.

Two or three individuals who tried the experiment of driving their turkeys when young, to a distance from the house, where the greatest number of insects were to be found, and feeding and housing them in the manner directed in the Agriculturist, have stated, that they have raised from 100 to 300 turkeys, and have pronounced it to be a method, which of all others, they believed to be best calculated to be attended with success.—*Southern Agriculturist.*

THE MEASUREMENT OF HAY IN THE STACK,

For the purpose of ascertaining its weight, is made by multiplying the length, breadth and height into each other; and if it has been allowed to settle in the stack during the winter, ten solid yards of meadow hay, in good condition, will generally weigh about one ton. The number of yards depending, however, partly upon the old or young state in which the grass was cut before it was made into hay, and partly upon the dry or moist condition in which it was stacked, as well as upon the length of time which it has lain—all these circumstances should be minutely examined; for if it is in a very large stack of more than a year old, nine, and in some cases eight yards will make a ton; clover, lying somewhat lighter in the stack, will generally take eleven or twelve yards to make a ton; and sometimes, when it has been staked very dry, thirteen may be required; but the average of the last year's clover may be assumed at twelve yards.*

* Bayldon on Rents and Tillages, 3d edit. p. 159. The mode of calculation is as follows:—Supposing the stack to be ten yards long at the bottom, and eleven at the eaves; four and a half wide at the bottom, and five and a half at the eaves; and presuming it to be four yards in height to the eaves; and to rise three yards to the point of the roof; in order to find the contents, the dimensions are summed up thus—

Medium length .... 10½ yards
Do. breadth ..... × 5
52½
Do. height..... ..... × 5 including one-third of the rise of the roof.
10) 262½ = 26¼ tons, or 29 1-6 loads.

If the stack swells out considerably towards the eaves, the height—if taken against the sides—will appear to be greater than it is in reality, it should therefore be measured by a pole set up perpendicularly to the eaves. When it is required to measure an irregularly formed stack, the contents may be found by giving and taking proportionate quantities of the separate parts, or by measuring or computing it in different divisions. If round, a more complex calculation is necessary, and can hardly be ascertained with accuracy without having resource to geometry. Mr. Bayldon, however, mentions a simple method, which consists in measuring the circumference at the bottom, and at regular distances up to the eaves, which must be added together, and divided by their joint number for a mean circumference; the sqaare of which must then be multiplied by the decimal .07958, and this product by the height up the eaves, and one-third of the rise of the roof, added together and this divided by 27 (the calcutation being made in feet) will give the product in decimal yards.

Young Men's Department.

Fairfield, Dec. 6th, 1824.

Dear Sir—The following remarks are from the pen of a young lady of a superior education, and thinking perhaps they may be beneficial to the laboring community, I with much reluctance obtained permission to forward them to you. If you think them worth publishing, you can insert them in your truly useful Cultivator.

L.

THE MIND MAKES THE MAN.

Power cannot arrest the mind, or agricultural pursuits fetter the understanding; and in youth these faculties are to be exerted; the talent given us, however trifling, is to be cultivated; and the principles which we carry with us through life are to be established. It is ere the shade of manhood flits across our brow, that we are fitted for the sphere which we are destined to occupy through life, and when the foundation of our future happiness is based.

An idea is prevalent, that those who move in the middle and lower walks of life, should not search deep into the hidden stores of literature; and this has (considering it to be a fatal error on which thousands have wrecked their frail barks,) elicited the following remarks. The impression to which so many adhere, that learning totally disqualifies the laboring part of community for their various avocations in life, has too long wound its serpentine coil around them, and been an almost insurmountable barrier to improvements in the agricultural and mechanical departments. And from the lack of knowledge, these branches of science have suffered, and doubtless will continue to suffer severely; and if this death-like legarthy which broods over our land cannot be removed, our country will be an irreparable loser.

In vain do our boasted patriots and philanthropists write, in blazing characters, *equality*, while the majority of the minds of our citizens remain steeped in the corrupted waters of ignorance and vice! True it is, that the greatest share of those who follow agricultural pursuits can read, write, and have a slight knowledge of geography, grammar and arithmetic; but a very limited number can be found who have proceeded far in the science of mathematics, or entered the rich and varied fields of natural philosophy; who have scanned the deep and majestic wonders of chemistry; traversed the classic fields of Greece and Rome, and imbibed the glowing sentiments, the golden and useful thoughts of ancient times. Yet upon these various sciences are based the mighty fabrics of mechanics and agriculture. Little do such imagine, that a building, however simple, is never erected without the rules of measuration, and if they understand not the art themselves, they are dependent upon the knowledge of others. While these are facts, should not the laboring class improve each moment as it wings its rapid flight towards eternity in storing their minds with substantial knowledge, which not only renders them respectable and valuable members of society, but will greatly contribute to their individual happiness through life. If all agriculturists were intimately acquainted with the study of chemistry, we should perceive that branch of labor reduced to a science. But instead of this, not one in a hundred has ever opened a treatise upon the subject, and evencan not name any of the terms.

Again: Natural philosophy is connected with both the mechanic and farming interests. By it, the mechanic is taught the use and form of the pulley, the inclined plane, the steelyards and their power; the pump and other hydraulics. If a person wishes to become perfect in his trade, let him first enter deeply into this science, and he soon will stand at the head of his profession. Long has public opinion held the mechanical and agricultural world in the chains of ignorance. Yet a few daring spirits have overstepped the narrow limits of prejudice, and perfected these sciences as they now appear.

It is required of a man who wishes to become an adept in the study of divinity, law or medicine, to pursue a course of study from seven to ten years. And shall those who are engaged in the most difficult of all professions, viz. that of mechanics and agriculture, scoff at the idea of book learning?

In the land of which we are citizens, all, to a certain extent, are placed on an equality; therefore, setting aside the utility of study, as applicable to the ordinary business of life, it is necessary to exercise it, on some occasions, in a political point of view; for here, every citizen may, by rotation, be called to stand in official stations. The liberties of our country are placed in the hands of such men; and as we are either learned or unlearned, so will our republic stand or fall. Was it knowledge that overthrew the republics of Greece and Rome? Surely not. The temples of the muses were deserted; ignorance, superstition, anarchy and confusion were exhibited in lieu of order, learning and constitutional propriety.

Ignorance is the soil where ambition ever over-shadows the neighboring plants; surmounts all difficulties, and finally stands triumphant amid general ruin and devastation. Shall the disgraceful farce of Cataline's conspiracy ever be reacted on the happy shores of the once peaceful America? Shall the chains of monarchy ever fetter the sons of liberty? Can it be, that the blood of our fathers has flowed in vain, and their sons have become the slaves of ambition; sold their birthright and bartered away their freedom, simply for the want of education? Our soil is well adapted to agriculture, and shall it, for want of tillage, refuse to yield its products, and become one barren waste? If the young men of these United States would read, and practise what they read, our country would speedily become even more productive than at present and then the sun of prosperity and happiness will continue to diffuse its benignant rays over our land, and peace and liberty will endure forever.

The objection is often raised, that the study of the ancient classic authors is altogether useless except to professional men. But this is a mistake. The Georgics of Virgil is the best work now extant on agriculture. One that was composed when agriculture languished in Italy, and consequently peace and happiness had fled from her borders. The general distress was attributed wholly to the administration of Augustus. The friends of this immortal poet deplored this state of affairs, which threatened the overthrow of the country, and requested him to write upon this subject. He readily acquiesced. Retiring from the jarring interests of politics and the intrigues of court, he performed the arduous task. The Georgics appeared in their elegant simplicity, joined with poetic grandeur.

He traces agriculture to its source; describes the implements proper for its use; notices the prognostics of the weather; the best method of managing various soils; of propagating fruit trees and the vine; the various kinds of cattle and bees. It is asserted, that Virgil did more for the prosperity of his country than he would have done, had he obtained the most splendid victories in the field of battle; for the country assumed a new and flourishing appearance, and peace, plenty and domestic happiness reappeared.

If the young men of this country wish to see their fair republic prosper—the wings of the eagle still spread over the land, then let them seize with avidity every means in their power to cultivate their minds as well as their lands: so shall their days be peace and happiness—their decline, like the setting sun in a calm summer's eve, full of glory.

Small rivulets, oozing from the mountain's brow, wend their way, clear and slow, through their contiguous neighborhood, giving life and refreshment to those within their reach, without attracting notice or applause, save from some humble admirer who tastes their sweetness, until they unite with tributary streams; when rolling on, deepening and widening in their progress, they are noted and admired at a distance from their source, like the majestic Mississippi, the father of waters in the western world, moving every obstruction from its way. Thus rivulets of knowledge flow from mercantile houses, mechanics' shops and farmers' dwellings, that not only exert a salutary influence on the surrounding community, but as they pass along, tributary streams flow in from every quarter, widening and deepening the channel already formed, until they constitute the palladium of our liberties, which can only be supported by the general diffusion of knowledge.

Suppose a man devotes two hours per day to study; in one year he reads seven hundred and thirty hours, or sixty days and ten hours, at twelve hours per day. In ten years, six hundred and eight days and four hours. In thirty years, eighteen hundred and twenty-five days, or five years. What vast stores of knowledge might thus be gathered, simply by spending two hours per day in study! Every person spends more time than this in idleness, and why not devote it to literature? Only spend this time in study, and our country will be blest with scientific farmers and mechanics, together with wise energetic statesmen.

E. A. R.

A TABLE, *to show at a glance the number of hills or plants contained in an acre of land, at any given distance from each other, from* 40 *feet by* 40, *to* 1 *foot by one, omitting fractions.*

feet.	feet.	per acre.	feet.	feet.	per acre.	feet.	feet.	per acre
40 by	40	27	8 by	7	777	3 9 ..	2 9	4224
39 ..	39	28	— ..	6	905	— ..	2 6	4646
38 ..	38	30	— ..	5	1089	— ..	2 3	5162
37 ..	37	31	— ..	4	1361	— ..	2 0	5808
36 ..	36	33	— ..	3	1815	— ..	1 9	6637
35 ..	35	35	— ..	2	2722	— ..	1 6	7744
34 ..	34	37	— ..	1	5445	— ..	1 3	9272
33 ..	33	40	7 ..	7 0	888	— ..	1 0	11616
32 ..	32	42	— ..	6 6	957	3 6 ..	3 6	3555
31 ..	31	45	— ..	6 0	1037	— ..	3 3	3829
30 ..	30	48	— ..	5 6	1131	— ..	3 0	4148
29 ..	29	51	— ..	5 0	1244	— ..	2 9	4525
28 ..	28	55	— ..	4 6	1382	— ..	2 6	4978
27 ..	27	59	— ..	4 0	1555	— ..	2 3	5531
26 ..	26	64	— ..	3 6	1777	— ..	2 0	6222
25 ..	25	69	— ..	3 0	2074	— ..	1 9	7111
24 ..	24	75	— ..	2 6	2489	— ..	1 6	8297
23 ..	23	82	— ..	2 0	3111	— ..	1 3	9956
22 ..	22	90	— ..	1 6	4148	— ..	1 0	12445
21 ..	21	98	— ..	1 0	6222	3 3 ..	3 3	4124
20 ..	20	108	6 ..	6 0	1210	— ..	3 0	4818
— ..	15	145	— ..	5 6	1320	— ..	2 9	4873
— ..	10	217	— ..	5 0	1452	— ..	2 6	5361
— ..	5	435	— ..	4 6	1613	— ..	2 3	5956
19 ..	19	120	— ..	4 0	1815	— ..	2 0	6701
— ..	15	152	— ..	3 6	2074	— ..	1 9	7658
— ..	10	229	— ..	3 0	2420	— ..	1 6	8935
— ..	5	458	— ..	2 6	2904	— ..	1 3	10722
18 ..	18	134	— ..	2 0	3630	— ..	1 0	13403
— ..	15	161	— ..	1 6	4840	3 0 ..	3 0	4840
— ..	10	242	— ..	1 0	7260	— ..	2 9	5289
— ..	5	484	5 6 ..	5 6	1417	— ..	2 6	5808
17 ..	17	150	— ..	5 0	1584	— ..	2 3	6453
— ..	15	170	— ..	4 6	1760	— ..	2 0	7260
— ..	10	256	— ..	4 0	1980	— ..	1 9	8297
— ..	5	512	— ..	3 6	2272	— ..	1 6	9680
16 ..	16	170	— ..	3 0	2640	— ..	1 3	11616
— ..	15	175	— ..	2 6	3168	— ..	1 0	14520
— ..	10	272	— ..	2 0	3960	2 9 ..	2 9	5760
— ..	5	544	— ..	1 6	5280	— ..	2 6	6336
15 ..	15	193	— ..	1 0	7920	— ..	2 3	7040
— ..	10	290	5 0 ..	5 0	1742	— ..	2 0	7920
— ..	5	580	— ..	4 6	1936	— ..	1 9	9051
14 ..	14	222	— ..	4 0	2178	— ..	1 6	10560
— ..	10	311	— ..	3 6	2489	— ..	1 3	12672
— ..	5	622	— ..	3 0	2904	— ..	1 0	15840
13 ..	13	257	— ..	2 6	3484	2 6 ..	2 6	6969
— ..	10	335	— ..	2 0	4356	— ..	2 3	7740
— ..	5	670	— ..	1 6	5808	— ..	2 0	8712
12 ..	12	302	— ..	1 0	8712	— ..	1 9	9956
— ..	10	363	4 6 ..	4 6	2151	— ..	1 6	11616
— ..	5	720	— ..	4 0	2420	— ..	1 3	13939
11 ..	11	360	— ..	3 6	2765	— ..	1 0	17424
— ..	10	396	— ..	3 0	3226	2 3 ..	2 3	8604
— ..	5	792	— ..	2 6	3872	— ..	2 0	9680
10 ..	10	435	— ..	2 0	4840	— ..	1 9	11062
— ..	9	484	— ..	1 6	6453	— ..	1 6	12906
— ..	8	544	— ..	1 0	9680	— ..	1 3	15488
— ..	7	622	4 0 ..	4 0	2722	— ..	1 0	19360
— ..	6	726	— ..	3 9	2904	2 0 ..	2 0	10890
— ..	5	871	— ..	3 6	3111	— ..	1 9	12445
— ..	4	1089	— ..	3 3	3350	— ..	1 6	14520
— ..	3	1452	— ..	3 0	3630	— ..	1 3	17424
— ..	2	2178	— ..	2 9	3960	— ..	1 0	21780
— ..	1	4356	— ..	2 6	4356	1 9 ..	1 9	14223
9 ..	9	537	— ..	2 3	4840	— ..	1 6	16594
— ..	8	605	— ..	2 0	5445	— ..	1 3	19913
— ..	7	691	— ..	1 9	6222	— ..	1 0	24454
— ..	6	806	— ..	1 6	7260	1 6 ..	1 6	19360
— ..	5	968	— ..	1 3	8712	— ..	1 3	23232
— ..	4	1210	— ..	1 0	10890	— ..	1 0	29040
— ..	3	1613	3 9 ..	3 9	3097	1 3 ..	1 3	27878
— ..	2	2420	— ..	3 6	3318	— ..	1 0	34848
— ..	1	4840	— ..	3 3	3574	1 0 ..	1 0	43560
8 ..	8	680	— ..	3 0	3872			

THE CULTIVATOR—FEB. 1835.

TO IMPROVE THE SOIL AND THE MIND.

WINTERING SHEEP.

In December flocks of sheep require a little of our time and attention; if these are bestowed, with subsequent ordinary care, sheep will commonly pass through the winter with trifling loss and much to our advantage. For want of attention in the commencement of winter I have seen large flocks nearly lost during its course, which might have been saved with a little previous care. But when it did occur, you could not convince their owners that it was their bad management, as they had made up their minds to impute it solely to their *bad luck*. It is always the best policy for the farmer to have his sheep in good condition when they begin the winter, and then they are sure to go well through it. If however they are permitted to enter it poor and light—good provender and a regular supply of it, which is the best that can then be done, although it may save the lives of some, will not carry them prosperously through it. The foundation of our loss of sheep in winter is laid during the season of pasturing, for the experience of every farmer will teach him that only give them enough to eat during the summer, the natural effect will be that they will put on flesh; and a sheep in good condition is easily and safely wintered, whilst it is a most difficult job to carry a poor sheep safe through the winter. It is wrong to permit them to ramble over the fields later than about the first of December, because at that time there is little nutriment in the scanty herbage on which they feed, and the blade of grass had better remain on the stem to protect it during the frosts and winds of winter, and prepare it for an early and vigorous growth in the spring; besides, as the supply to the animal is small, and innutritious, there is great danger that there will be a falling off in its flesh, which it can illy spare, and which to its subsequent existence it is so necessary it should now retain. I have frequently thought that an open December, which is often wished for by the farmer to save his winter supply of hay, is more prejudicial to his sheep, when they ramble over the fields, and to his own interest, than he is generally aware of. It would certainly comport more with real economy, if he were to bring up his sheep by the 10th or at farthest the 15th of this month, into winter quarters, even if the weather should remain warm and the ground uncovered; for if they lose flesh at this time, they cannot regain it until spring, and the mortality which sometimes costs almost entire flocks is imputable in a measure to this cause.

Sheep in winter should have sheds; the preservation of their health requires this indulgence, and nature prompts to it. Let me ask, if they have the choice, do they remain in the open air in a storm? No, they as instinctively run to their covering as a man does to his house, and if they do not require it quite as much, they appear quite as well for the shelter. For a flock of poor sheep a protection from the weather is all important. Those in good condition do not as much want it, as they have a better coat both of flesh and wool; but for them it is likewise useful, and a good farmer will not omit to give all the requisite shelter. In those countries in Europe which grow large quantities of the finest wool, they find it indispensable to the attainment of their object, that is fine wool, that their sheep are sheltered from storms both summer and winter, and they have made their arrangements accordingly, for they herd them every night and narrowly watch the indications of the weather during the day. They say that rain and snow give a hardness and coarseness to the wool which they can obviate by a sufficiency of shelter. But to our subject; as soon as sheep are brought in to the yard for winter, the different kinds of lambs, ewes, and wethers should be carefully separated and kept apart. It is important that those in one yard should be as nearly of a size as practicable; for by being so, there are no strong ones among them, to drive the weaker from their provender. All will then feed alike and do well. The flocks ought likewise to be as small as we can conveniently make them. It is an invariable rule that a small flock does much better than a large one, even if both, according to their number, are fed equally well. If the flocks in each yard can be reduced to between fifty and one hundred, so much the better; and it is a great desideratum to make them as few as fifty if it can in any way be effected. It is also necessary to have a separate yard for old and poor sheep, and if there are any in the flock that do not subsequently do well they should be removed into what is commonly called the hospital. These hospital sheep, by being few in number, having a good warm shed, a sheaf of oats, or a few screenings from under the fanning mill, once a day, will soon begin to improve. I have had my hospital sheep in a better condition with this care by spring than any other flock, and I must say that for the last three seasons, my sheep were in better condition when I turned them out of my yards in the spring, than when I put them there in the beginning of winter. Sheep ought to be rather sparingly than sumptuously fed, three times a day, and out of racks, to prevent them from running over and trampling on the hay. As soon as one is seen in any of the flocks to become thin, it ought to be removed at once into the hospital where it will be better fed. If you neglect to do this it will soon be too late, and you will suffer loss; for a sheep once reduced to a certain point cannot be recovered. It is of service to give them a feeding of straw, or pine tops, if you please; for it invigorates their health and makes a change in their food. They ought all to be daily watered, and if your hay has not been salted, to have a lick of salt occasionally. The opinion that sheep do not want water is erroneous; repeated observation has convinced me that it is almost as indispensable to their welfare as their food, and the sooner farmers get rid of this notion the better for both their interests and understanding. I have tried the experiment of keeping sheep without water in conformity with this improper custom so often and thoroughly, that I have come to the conclusion that the only safe rule is the opposite one. I could repeat the several occasions when I have acted upon this plan for my own information, were it necessary, but I only add that the result in my hands was invariable, that is, my sheep grew thin, as it was, that they immediately improved when I adopted an opposite practice. With this care you will save all your sheep; or not lose more of them than you would of the same number of horses and cattle. They will have no disease among them. I have often thought of an observation, made to me by an experienced woolgrower from whom I once asked for information of the diseases of sheep; he answered, "What have you to do with the diseases of sheep? take care of them and you will have no need for remedies." This observation struck me as strange at the time, but subsequent experience has amply confirmed it. And now, what will the farmer gain by keeping his sheep well? In the first place, he will save his hay, a fat sheep will not eat so much as a poor one; he will save all his grain—sheep in good condition do not require any. In the next place, he will save all his sheep—he will have more and better lambs in the spring, besides several ounces more of wool to each sheep; and what is better than all the rest, he will in the end save himself loss and anxiety. The saving will at least be from one-eighth to one-fourth of the value of his flock, and all this attending to a necessary work in due season.

A.

UNFERMENTED MANURES.

We are decidedly in favor of applying manures, in farm culture, in an unfermented, or partially fermented state whenever it can be conveniently done, for the reason, that the manure of the farm yard, when thus applied, goes twice as far in enriching the soil, as it will if not applied till after it has become completely rotted. The gases which rise from the fermenting mass, and which are dissipated by the winds,—and the liquids which flow from the dung, are as much the food of plants, as the black carbonaceous matter which remains after fermentation. Besides, the very process of fermentation, after the manure is buried in the field, imparts a genial warmth to the soil, and renders it porous and more permeable to the salutary influence of the sun and atmosphere. But there is one important point which should by no means be lost sight of:—*long manure should never be applied directly to the small grains, or crops which are cultivated exclusively for their seeds,—but to hoed crops, and such as are cultivated more particularly on account of their stems, stalks or roots.* The matters first given off in fermentation seem particularly adapted to cause a rank growth of stalk, which is rather inauspicious to a great product of perfect seed. The cow that takes on flesh rapidly cannot at the same time be a good milker, because the food which she takes cannot be converted both into flesh and into milk. The luxuriant growing fruit tree, with straight upright branches, will not give a heavy burden of fruit—because the food required to nourish and mature the fruit, is converted into wood; and hence artificial means are adopted to check the growth of wood, by transplanting, training the limbs horizontally, ring-barking, grafting on dwarf stocks, &c. to induce early bearing, or an increase of fruit. So with farm crops, cultivated for their seeds—a too luxuriant growth of stock lessens the quantity, and depreciates the quality of the seed. The gases which es-

cape from fermenting manure, in the soil, are prepared food, are imbibed immediately by the mouths of plants, and cause a rapid growth. On the other hand, as a general rule, the cow does not take on much fat while she yields a great supply of milk,—the fruit trees does not make much wood while it is sustaining a heavy burthen of fruit, nor do the small grains that mature a heavy crop of seed, generally show a rank luxuriant growth of straw. The decomposition of rotten dung (for even this must undergo decomposition ere it becomes food for plants) is more slow,—little or no heat is evolved, and the process of nutrition goes on in its natural course, without artificial stimulus, which unfermented manures may be considered as imparting.

It may be alleged, that corn, if not potatoes and turnips, affords an exception to the proposition we have laid down, inasmuch as it is cultivated for its seed, and is not injured by long manure. A moment's consideration will show a marked difference between this and the small grains. The latter mature their seeds during the intense heats of the summer, when the fermentation of vegetable matter in the soil is most rapid, and when long manure is most prejudicial in its influence upon the seed. A surfeit of food, at this time, by inducing rank growth, often causes a disrupture of the sap vessels, and destroys the organization of the plant. Not so with the voracious maize: This season of heat and fermentation is precisely the time when its appetite craves an abundance of gaseous food, to mature its stocks and leaves; and before the grain is formed, fermentation has nearly subsided, and the soil then imparts only the food which is congenial to the perfection of the seed. Thus the stock and the seed are supplied with their appropriate food at the precise time when each stands most in need of it. The same remarks will apply in a great measure to the potato and the turnip—their roots are produced after fermentation has exhausted its force upon the manure. Perhaps, indeed, the rule may be narrowed down to this —*that long manure be exclusively applied to crops which come to maturity in autumn*,—and that for all crops which ripen their seeds about midsummer, fermented manure is most suitable, or long manure applied to a previous and hoed crop.

Our own practice has afforded striking evidence of the superior value of long manure to the corn crop. In the winter of 1823, we had a quantity of stable dung taken on to a field designed for corn, and before planting, it had undergone a pretty thorough fermentation. It was applied to one part of the field. On to an adjoining part we carried a good supply of long dung from the cattle yard, principally corn stalks, straw and the droppings of the stock. It had been trodden under foot, and had apparently undergone no fermentation—we were obliged to cut it with an axe in order to load it. The dressing of the long manure was about equal to that which had rotted when taken into the field. Both were planted with corn, and treated alike. The part dressed with rotted dung had a manifest advantage in the early part of the season, and until the long dung began to ferment, when this part of the field gained rapidly, and at harvesting had a manifest advantage. An acre was gathered in an afternoon, husked, weighed and measured, by about twenty persons. It was a general opinion that the long manure gave from a fourth to a fifth more produce than the short dung. The product in shelled corn was over one hundred and eighteen bushels. The shrinkage to the first of May following was nearly twenty per cent, or one-fifth.

AMERICAN SILK.

We have received a sample of exquisitely beautiful silk, produced on the farm of E. Goodrich, Esq. of Hartford, Conn. which we design to exhibit at the anniversary of the State Agricultural Society. The sample was reeled on the Italian reel. It is worth from five to six dollars per pound. A young girl, after, one day's practice, can reel a pound per day.

Mr. Goodrich, we believe, has planted out more mulberry trees than any other person in the United States; and while we tender to him our thanks for the beautiful specimen of silk which he has sent us, we cannot be unmindful of his ability, nor can we doubt his willingness, to lay us and the public under still greater obligations, by communicating, for the Cultivator, some results of his experience and observation in the silk business. Under these impressions, we respectfully solicit from Mr. G. in behalf of the public as well as of ourselves, answers to the following queries, and such other information upon this interesting subject, as he may please to communicate.

1. Can the silk business be profitably managed by the generality of farmers—or by any particular and what class of them?
2. What is the nature of the bounty offered by the state of Connecticut for the cultivation of silk, and its probable advantages or disadvantages?
3. Does there promise to be a ready and permanent market for cocoons—and can the reeling process be managed with economy and profit by the cultivator?

CHENOPODIUM QUINOA—AND THE POTATO.

The first is the botanical name of a Mexican plant, the culture of which is now arresting the public attention in England. Humboldt says, that this plant, in Mexico, ranks in utility with the potato, the maize and the wheat. The leaves are used as spinach, or sorrel, or as greens; and the seeds in soups and broths, or as rice. The plant is an annual, and resembles French spinach. The seeds are small, yellowish white, and resemble somewhat those of millet. In 1834 seeds ripened in abundance in England for the first time, and as a field plant, it is considered a great acquisition. It is believed it may be cultivated as common as barley, and on any ground which will produce that grain. The Quinoa will no doubt ripen its seeds in the United States, even in our latitude, better than in England, and our consular agents, naval officers, or commercial men, might render a public service by introducing it among us.

When we consider the comparative recent introduction of the potato (*Solanum tuberosa*) among many civilized nations, the prejudices which in many nations for a long time retarded its introduction, and the large space it now occupies in domestic economy, as food for man and beast, in almost every part of the civilized world, these considerations should induce us to give a fair trial to every foreign plant which promises to be useful in our husbandry. The first field culture of the potato in Scotland was in 1739, less than a century ago. They were left in the same spot of ground from year to year; a few tubers were perhaps used in autumn, and the parent plants well covered with litter, to save them from the winter's frost. The progress of the culture was afterwards greatly retarded, by the fact, that "potatoes are not mentioned in the bible," which was deemed a sufficient reason for rejecting them. Ignorance of the proper mode of cooking them, (an evil which has not wholly ceased at this day) also retarded their culture. "A person who had been invited to taste the first potato in the county of Forfair, about 1730, related that the roots had been merely heated, and that they adhered to the teeth like glue, while their flavor was far from agreeable. The food was about to be condemned through the ignorance of the cook, when the accidental arrival of a gentleman, who had tasted a potato in Lancashire, caused the rejected roots to be remanded back to the hot turf ashes, till they became as dainty as they had before been nauseous." "It is only within these forty years that any particular attention has been paid in France to the cultivation of potatoes. They were long regarded as an unwholesome plant, and only fit to be eaten by cattle and the most wretched human beings." It required all the efforts of royal authority, supported by royal example, to eradicate the popular prejudice against them. Now so diversified is the manner of cooking the potato in France, that a gentlemen is said to have dined a party of friends, sumptuously, entirely upon potatoes, cooked in thirty-two various modes. "The composition of the potato root is very similar to that of the seeds of the maize and wheat; though, from the dissimilarity in taste and external appearance, this would not be at first suspected; and hence arises the corresponding fitness of all three for food. The principal difference between wheat and potatoes consists in the presence of a substance called *gluten* in wheat."

The detection of this similarity between grain and potatoes, by chemical analysis, led to the experiment of extracting *sugar* from the potato. As we have been inquired of, as to the process of extracting sugar from the potato, we subjoin the particulars, as we find them in the Edinburgh Quarterly Journal of Agriculture—the discovery and the experiments having been first made, we believe in the state of New-York.

The potatoes are first ground or grated in a mill, similar or the same, as we denominate the grater cider mill, by which they are reduced, with surprising rapidity, to a fine pulp, and from which, by the aid of a sieve and water, the starch, in great purity, is readily obtained. The starch thus obtained, is then dissolved completely in water, heated by steam let into it. A certain quantity of sulphuric acid, or vitriol, is then mixed with it, and heat being applied, the

whole of the starch is converted into syrup. This is to be purified from the acid by adding quick lime, with which the acid unites, and then evaporating the liquid. The sugar remains after evaporation, and is used for all domestic purposes. Its taste is that of delicious sweet, and as an article of diet is probably more healthful, and less oppressive to the stomach, than any other sweet substance in use. It is particularly useful in making sweatmeats, and may be used at table as honey. A bushel, or sixty pounds of potatoes, will give eight pounds starch, and eight or seven and a half pounds sugar. The article, which we here abridge, seems to have been copied from Silliman's Journal, which may contain a more detailed account of the process.

There are various other uses to which this valuable root is now converted, that our ancestors never dreamt of. From the potato may now be procured bread, starch, jelly, sugar, treacle, beer, brandy, cheese, butter, coffee, tapioca, dye-stuffs, size, cleansing liquids, and medicine.

The Russians, (and we have seen a notice of the same having been done in Ohio) obtain from it *treacle* or molasses. The Swedes and English obtain from it brandy by distillation. Dr. Anderson obtained a gallon of *spirits* from seventy-two pounds, of a mild agreeable flavor. The Saxons make from it a kind of *cheese*, which retains its freshness for years if kept in a close vessel. It is prepared by boiling the potatoes, and reducing them, when cold, to a pulp, rejecting the skins; sour milk is added, or else sweet curd, with the whey pressed out, in the proportion of a pint to five pounds of pulp. It is kneaded several times, drained in small baskets, and simply dried in the shade. A French chemist has converted the potato into a substance resembling, and he says superior to, *coffee*. He mixes some best olive oil with a certain portion of dried potato-flour, and then adds a small portion of coffee powder. The Germans incorporate it, after being steamed and reduced to a paste, with the *butter* to be spread over bread. Chemical ingenuity has likewise converted it into substitutes for *arrow-root*, *chocolate*, *tapioca*, and *vermicelli*. The Danes have discovered in the flowers the material for a beautiful yellow dye, solid and durable, which by being afterwards plunged into a blue dye, becomes a perfect green. The potato is always used with excellent effect in steam boilers, for preventing the gathering of a calcareous incrustation on their bottoms. The liquor drawn off in the process of making potato starch, will clean silks, woollens or cottons, without damage to the texture or colour. The French administer it, roasted, and with success, medicinally, to their sailors, as a preventative of, and even cure for, the scurvy.—*See Quarterly Jour. of Ag.*

AGRICULTURAL INSTRUCTION IN PRIMARY SCHOOLS.

The agriculture of Bavaria is said to have improved more rapidly, in the last half century, than that of any other country, Scotland, perhaps, excepted. Before the French revolution it was behind that of the other German States. The lands then mostly belonged to the religious establishments. The cultivators merely lived; they did not thrive. When these lands were sold, they were made into small parcels, and almost every man became the proprietor of the portion he cultivated, upon a long credit. The great impulse to improvement was given to the young generation, in the primary schools. In these were taught, both by books and examples, AGRICULTURE and GARDENING. For this purpose, catechisms of gardening, of agriculture, of domestic economy, of forest culture, of orchard culture, &c. in small 12mo. volumes, with wood-cuts, were introduced as class books for boys, and the like on the management of silk worms, household economy and cookery, for the girls; and there was attached to every district school at least half an acre of land, for experimental gardening, where the scholars received recreation and instruction, in the hours of exemption from study, from the master, in the practice of gardening. And it was made an indispensable qualification in teachers, to be competent to give this instruction. "Since these schools have come into action," says a late traveller, "an entirely new generation of cultivators has arisen, and the consequence is, that agriculture in Bavaria is carried to a higher degree of perfection than it is any where else in the central states of Germany." "The result of the whole of the information procured, and of the observations made, is, that we think the inhabitants of Bavaria promise soon to be, if they are not already, the happiest people in Germany. The climate of the country will prevent its agriculture and gardening from advancing beyond a certain point, but to that point both will very soon be carried."

The salutary influence of agricultural and horticultural instruction, in common schools, has not been confined, in Bavaria, to the improvement of the soil. As consequences which naturally follow the improvement of agriculture, the roads, bridges and other public works have undergone a corresponding improvement; individual comforts have been greatly multiplied, business of every kind has been improved, and human intellect, reanimated as it were, by the magic pen of a Hazzi, has burst its cerements, and become an efficient aid in the noble work of improvement. The public roads are all lined with ornamental fruit-bearing or forest trees—and furnished with guide-boards, mile-stones, and seats, at intervals, of stones or sods, for the weary traveller. This novel sort of education, and the blessings which have flown from it, and the still greater blessings which appear in prospect, have resulted from the wise provisions of the government, aided, and efficiently aided, by the active and patriotic philanthropy, of M. Hazzi, the editor of an agricultural journal at Munich, and author of the school catechisms of which we have spoken.

Nineteen out of every twenty of the children of our common schools, would be benefitted, while the twentieth would not be injured, by the elementary studies which have proved so beneficial to Bavaria. "*As the twig is bent so is the tree inclincd.*" Early impressions have an influence through life; and it is all important that these early impressions should be of the right kind—such as are best calculated to advance the interests of the individual, and the good of the public. What can conduce more to these desirable ends than to instruct our youth in the elementary knowledge of the business which they are to follow through life, and upon their success in which must materially depend their respectability, their happiness and their worth to society. Husbandry is a business in which there is always something to learn, even in the longest term of life. The sooner the study is began, the more proficiency will be made; and the more one becomes acquainted with its varied sources of true enjoyment, the stronger is his attachment to its pursuits.

Hoven in Cattle.—We find in Lawrence, a high authority, the following prescriptions for this disease, which we copy on account of the safety and facility with which they may be tried, believing, without however knowing, that they may prove efficacious. The first is —an ounce of gun powder given to the beast in a pint of milk, or a less quantity of gin. The second—give an egg-shell full of tar.

Rhubarb.—This is one of the many plants which a farmer may have in his garden, and which may be made to contribute to the delicacies of his table, and to the health and comfort of his family, with very little expense or labor. The plant is perennial, and resembles much in its habits the burdock, though the leaves and their stalks may be somewhat larger, in a good soil. A dozen plants will serve to supply a family. The leaf stocks are the parts used. The skin or cuticle is pealed off—they are then cut into quarter or half inch pieces, and used without further preparation, with sugar and spices. like unripe gooseberries, for pies and tarts, which fruit it very much resembles in flavor. It may be used in the spring, and till midsummer. Medical men ascribe to it a salutary influence upon health, particularly to children, when used in this way. The seed ripens about midsummer, at which time it may be sown.

Dried Fruits.—The general failure of fruit throughout the country in the last year, induced us, as it did many others, to substitute, for family use, dried fruits of the preceding year. From the quantity we found in the hands of a single retailer, we were led to form a new estimate of this proffered source of gain to the farmer. The gentlemen upon whom we called had about 600 bushels of dried apples, 500 bushels of peaches, and a large quantity of dried damson plums. The prices were $2.50 for the apples, $4 for the peaches, and $8 for the plums, (freed from the pits,) and these prices, we understand, subsequently advanced. He informed us that they mostly all came from Ohio. Here there was some five or six thousand dollars saved by the prudent industry, we presume, of our fair country women. We state these facts for the benefit of those who have been accustomed to overlook this source of farm profits. Dried fruits will always be in demand, not only for our cities and towns, but for exportation.

To make Currant Jelly.—Take the juice of red currants one lb. sugar 6 oz. Boil down.——*Strawberry Jelly.*—Take of the juice of strawberries 4 lbs. sugar 2 lbs. Boil down.

MAXIMS.

The passions act as winds to propel our vessel—our reason is the pilot that steers her;—without the winds she would not move;—without the pilot she would be lost.

I should prefer being indisposed, to being idle.—*Seneca.* The evil of a slight fit of sickness is transient, while the bad effects of idleness are permanent, and lead to vicious habits.

The most sure method to be deceived, is to consider yourself more cunning than others.—*Rochefaucault.*

Moderate things last long.—*Seneca.* All the blessings of Providence, all the possessions of this world, may be exhausted by excess, or turned into evils by misapplication or abuse.

Good fortune and bad are equally necessary to man, to fit him to meet the contingencies of life.—*French.* Few men, who have not experienced the vicissitudes of fortune, know how to bear them with firmness—are fit to meet them.

CORRESPONDENCE.

DON PEDRO.

Mr. Buel,—I now redeem my pledge, in the last number of the Cultivator, of giving a representation and history of "Don Pedro." The cut* was executed by Mr. Hall, a young artist of great promise, now a resident of this city. It is copied from a copper-plate engraving by Murry, and published in the "*Archives of Useful Knowledge*," at Philadelphia, in 1810, from which the following history is extracted.

Several gentlemen have promised to have correct drawings made of superior cattle, sheep and swine now in their possession, which the editors have proposed to have engraved on wood, (of which the above is a specimen,) and published in the next volume of the Cultivator, with an account of their usefulness and superior qualities, &c. &c.

AMATEUR.

Don Pedro was imported into the United States, in the year 1801 and is believed to be the first full-blooded Merino ram introduced into North America.

Mr. Dupont de Nemours, then in France, had persuaded Mr. Delessert, a banker of Paris, to send to this country some of those valuable sheep, and he having been at the head of a commission appointed by the French government to select in Spain, 4,000 Merino sheep out of the number of 6,000, which, by the treaty of Basle, the Spanish government had stipulated to present to France; it is natural to suppose that those which he selected for his own flock, were among the best. Four fine young ram lambs were accordingly shipped, two were intended for Mr. Delessert's farm, called Rosendale, situated near Kingston, on the Hudson river; one was intended for Mr. Dupont de Nemours, who was at that time settled in the vicinity of New-York, and the other was to be presented to Mr. Thomas Jefferson. Mr. Dupont embarked in the ship Benjamin Franklin, on board of which ship the four lambs were shipped, and was unfortunately detained upwards of twenty days in England; his subsequent passage to the United States was long and boisterous, in consequence of which three of the sheep died, and it was with the greatest difficulty that Mr. Dupont preserved the fourth. The ship arrived at Philadelphia on the 16th of July, 1801.

In 1801, Pedro tupped nine ewes at Mr. Dupont's place near New-York; he was then sent to Mr. Delessert's farm, and served a large flock during the years 1802, 3 and 4. In the course of 1805, Mr. Delessert having determined to rent his farm, and to sell all his stock, the progeny of Pedro were sold at public sale, at reduced prices, to the neighboring farmers, who had no idea of the treasure which was offered to them; being unacquainted with that breed of sheep, they neglected those valuable animals, great numbers of which have perished in their hands, or were sold to butchers; the rest would probably have shared the same fate, had not Chancellor Livingston become acquainted with the existence of those sheep, and purchased at advanced prices some of the ewes, which he put to his fine Merino rams of the Rambouillet stock. Pedro, like the rest of the flock of the Rosendale farm, was sold at vendue, and Mr. Dupont's agent bought him for sixty dollars.

In July, 1805, Pedro was removed to E. I. Dupont's farm situated in the state of Delaware, near the borough of Wilmington. That gentleman had a very small flock at that time, but was anxious to see that valuable breed propagated in the country, and with a view to attain that end, he offered the farmers of his neighborhood the use of his ram, gratis; they could not be prevailed upon to think much of what was offered to them free of cost; the consequence was, that very few ewes were sent to Pedro during three seasons, and only by way of experiment.

In 1808, however, Mr. Dupont, with a view of increasing his own flock, purchased from the farmers, his neighbors, as many half or three-quarter blooded ewes of Pedro's breed as he was able to collect, which measure raised his character among the farmers. Since that time, Pedro has served every year, from sixty to eighty ewes; the vicinity of Wilmington will therefore be supplied with a large stock of fine woolled sheep, and as Mr. Dupont & Co. are erecting works for the purpose, cloth of any fineness may be made.

Pedro is now (1810,) ten years old, but very strong and active: he is stout, short and woolly, and of much better form than Merinos commonly are; and even better than that of a ram figured in a superb engraving lately received by the Agricultural Society of Philadelphia from Paris. His horns are large and spiral; his legs short, and he weighs 138 pounds; his fleece carefully washed in cold water, weighs eight and a half pounds, is extremely fine; the staple one and three-fourth inches long, and lying very thick and close upon his body; it is entirely free from loose coarse hairs called jarr. Every part of his fleece, moreover, is nearly of equal fineness; even the wool of the hind legs and thighs, which is long and coarse upon many Merino sheep, is short and fine upon Pedro. This point, which in the case of wool so valuable as that of Merino sheep is of great consequence, will be transmitted to his progeny, and proves the value of stock derived from him.

* Since the first edition of the Cultivator was printed, the cut above referred to has been lost or destroyed.

Owego, Tioga co. Dec. 29, 1834.

J. Buel, Esq.—Dear Sir—Will you please give to the public, through your valuable agricultural paper, (the Cultivator) the following recipe for the cure of that formidable disease of the horse, called

THE POLL EVIL.

As soon as the tumor appears, make a strong decoction of the root of the meadow plant or vine, known by the name of *poison ivy*, and sometimes by that of mercury; bathe the tumor with this decoction every day, as hot as the horse will bear it; and heat it in with a hot iron. In a short time it will begin to diminish, and in six weeks it will wholly subside. A very valuable horse of mine was attacked with this disease last summer, and two months, after we first discovered it, were consumed in experiments of various kinds, when I became discouraged, and gave up the horse as lost. The tumor became appalling, so much so, that the best of our farriers declined to undertake a cure, and advised me to sell my horse for the best price that I could get; when shortly afterward, I accidentally heard of the above remedy, I tried it, and with complete success. No trace of the disease remains, although when I commenced the application, the horse was so bad that he could not drop his head low enough to drink, unless he was driven into deep water. I have no doubt the remedy is a specific, if applied in time. How long, before the tumor breaks, the application, to be successful, must be made, I am not able to say—but the tumor on my horse must have been three months advancing, before we commenced our application:

As I am ignorant of veterinary nosology, I hope you will give the technical name of the disease, and for the same reason, I hope you will give the botanical name of the plant which effected the cure.*

I have the honor to be, your obedient servant,

IRA CLIZBE.

A NEW MATERIAL FOR MAKING PORK.

We have long known that apples would fatten hogs, but until we received the following communication, it had never entered our mind, that *apple pomace* could be successfully employed for this purpose. The statement of our correspondent would have been more satisfactory, if the weight and value of the hogs, in the spring, or previous to their having been put up to fatten, had been stated. There is little doubt, however, that the apple pomace contributed essentially to augment the quantity of pork, and the more so in consequence of the cooking process, and so far as it did so, was manifestly a clear gain.

"While addressing you, permit me to give you an account of my experiment on hogs this season. On the 15th October last, I shut

* The technical name of the disease is *Poll Evil*—the botanical name of the plant *Rhus toxicodendron*, var. *radicans*.

up to fatten eleven hogs, about fifteen months old, and six shoats which were pigged the 15th May last, having given to the whole nothing during the summer but the wash from the dairy, with a small orchard of about an acre and a half of ground, where they ate the premature apples that fell. I proceeded to fatten them by steaming six bushels of small refuse potatoes with fourteen bushels of apple pomace, and one hundred weight of buckwheat canal [bran], the whole incorporated well together while hot from the steamer with a wooden pounder, adding to the mixture the dairy wash, and supplying them with a plenty of charcoal and pure water. They were divided into three lots, and closely confined. I continued to give them this mixture until nine days before they were killed, during which latter period they were fed with corn. They were slaughtered on the first of December. The expense of fattening, and the product, in pork, pigs, &c. are as follows:

30 bushels small potatoes, at 2s. 6d.....	$9 37½
8 cwt. buckweat canal, 8s. per cwt.....	8 00
21½ bushels corn given the last nine days,.....	13 43
Apple pomace, say	00 00
Total expense of food, ...	$30 80½
Cr. By 36 cwt. 50 lbs. pork, at $5,.....	$182 50
50 roasting pigs sold during summer,.....	50 00
6 shoats sold alive, ...	12 00
4 do. on hand, worth,.....	6 00
	250 50
Deduct expense,.....	30 80
Balance,.....	$219 70

Respectfully, THOS. MIDFORD.

Ball Farm, Hyde-Park, Jan. 1, 1835.

Nile Mile Prairie, Perry co. Illinois, Dec. 14, 1834.

Amongst the means of improving not only agriculture but the condition of society at large, I would beg leave to suggest the importance of placing common schools upon the manual labor system. Land is not yet so dear in almost any part of the United States, but that a small experimental farm might be attached to the common schools; and certainly there must be a superiority n a system of education, in which the books of children should treat on subjects tangible to the senses; subjects by which they should be continually surrounded, and circumstances of every day occurrence, over the common system, which too frequently places in their hands books which neither child nor teacher can understand. Any one who has attended to the nature of the infant mind, well knows that books which treat on the domestic animals, insects, flowers, and the various articles used either as food or clothing for the human race, and the different processes which they undergo in order to render them fit for our use, interest children above all others. Shall not children, whilst they eat fruit, learn both theoretically and practically, the proper mode of cultivating it? or is it irrational, to teach them how to raise grain and manufacture it into bread? or why should they be left ignorant of the management of the cow, or of the nature of milk, butter and cheese? What can produce greater delight to the infant mind, than the discovery of the various changes of the silkworm?—changes which belong nearly to the whole tribe of insects, but which changes are unknown to a large majority of our agriculturists. If we consider not only the superiority of a such a system of education, in rendering the rising generation rational, but likewise the profit which attends the employment of the children in healthy occupations, certainly it ought to be sufficient to induce every lover of his country to endeavor to effect so desirable a change.

J. BRAYSHAW.

J. BUEL, Esq.—Sir—In the September number of the Cultivator, under the head of "*Improved cheese shelves*," I noticed the description of Mr. Blurton's machine for turning cheese, and resolved to test the utility of his plan by actual experiment, and accordingly constructed a machine upon that principle, but instead of twelve we used but seven shelves of sufficient length to accommodate three cheeses each, and framed into the heads of the frame at a proper distance from each other to admit the hand between the cheese and the shelf next above it, for the purpose of rubbing them, (say three inches more than the thickness of the cheeses.) This frame when filled, holds eighteen cheeses, weighing from 100 to 170 pounds each, and being placed on the shelves so that they will as nearly balance each other as possible. The whole are turned by one man in as little time, and with less exertion than is required to turn one cheese of the former size, in the usual method of taking them off the shelves to turn them. We found it necessary for large soft cheeses to have semi-circular bearers made to fit about one-sixth part of the circumference of the cheese, which are singly laid in and allowed to remain between the cheeses and the "bars" that support them while turning, which effectually prevents them from flattening or breaking on the side exposed to the pressure, while in the act of turning. We have used this machine since the middle of last September, and it succeeds to our entire satisfaction, and have since made more on the same plan. It is our opinion, (although we have not had opportunity to test its utility in the heat of summer,) that upon this plan, cheeses of any size, however soft, may be turned at any season of the year, with as little injury as in any manner with which we are acquainted. The principal advantages which attend the use of this machine are, a great abridgment of labor in turning cheese, which in large dairies, as now practised, is very considerable and fatiguing; also that of having every day, dry shelves to turn the cheeses upon, as the sides of the shelves on which the cheeses drop, have in the former position of the frame, been above the cheeses, and exposed to a current of air for twenty-four hours previous, which in a great measure prevents mould, and the necessity of rubbing the cheeses; and a room filled with these machines will hold much more cheese than it will on shelves at the sides, or on counters. As the expense of a single machine, or frame, is trifling, I would recommend the trial of them to dairymen who are disposed to try experiments.

Yours, respectfully,
EPHRAIM PERKINS, Jr.

South Trenton, December 22d, 1834.

P. S. For further descriptions, see number seven of the Cultivator.

Elements of Practical Agriculture,

By David Low, Professor of Agriculture, &c.

MEANS OF INCREASING THE PRODUCTIVE POWERS OF SOILS.

The means at our command of increasing the productive powers of soils may be comprehended under the following general heads:—

1. Supplying to the soil those organic and earthy substances which may be required.
2. Altering its texture, depth and properties, by tillage and other means.
3. Changing its relation with respect to moisture.
4. Changing its relation with respect to temperature.

Vegetable and animal matters, in a decomposing state, appear to act in various ways, in increasing the productive powers of the soil. They improve its texture, and they may be supposed to increase its power to absorb and retain moisture; but above all, they supply that matter, which, in whatever form conveyed to the organs of plants, tends to nourish them. This matter being absorbed by the roots of plants, it must be supplied when exhausted.

Experience has in every age accordingly taught the husbandman to supply those substances to the soil; and the doing so forms one of the most important means at his command of maintaining or increasing its fertility.

Besides the animal and vegetable matter which is mixed or combined with the mineral part of the soil, and is essential to its productiveness, the mineral parts themselves, it has been seen, require to be mixed together in certain proportions, and in certain states of division, in order to produce the greatest degree of fertility.

Silica and alumina form the principal mineral part of the soil. If one or the other of these earths be in excess, the soil is defective in its composition. If the alumina prevails the soil is too adhesive; if the silica prevails, it is too loose. A medium is seen to be the best; and although the precise proportion in which the alumina and silica should exist have not been determined, it is safer that there be a tendency to an excess of alumina than silica.

Further, the fertility of the soil depends on the state of division, chemical or mechanical, of these minerals.

It would appear, then, to be a means of improving the composition of a soil, to add to its silicious matter when it is found to be too stiff, and aluminous matter when it is found to be too loose; and

further, to reduce the substances to their greatest degree of mechanical or chemical division.

Sometimes, accordingly, we have the means of improving the constitution of soils, by mixing sand with clay, or clay with sand.—But, in practice, the direct mixing of these two substances, for the purpose of producing a soil of better texture, is rare; *First*, because the expense of this species of improvement is considerable; and, *Second*, because in the state in which sand and clay are usually available for this purpose, it seldom happens that the aluminous matter of the one, or the silicious matter of the other, is in that state of minute division which is favorable to fertility.

It is otherwise with earth lime. This can, in all cases, be reduced by heat to that state of minute division which is favorable to the productiveness of soils; and hence can always be applied with benefit to those soils in which it is wanting.

Lime is sometimes mixed, in its natural state, with aluminous and silicious matter. It then forms a marl, a substance which is frequently applied to soils as a means of improving them; it is chiefly to the lighter soils that lime is applied; for then, is not only lime applied, but alumina, to improve the texture of the soil. It is by means of this mixture that some of the greatest improvements on silicious sands that have taken place in Europe, have been effected.

There are cases in which even calcareous matter is in excess in soils. This occurs especially in districts where the chalk formation exists. When the earthy stratum resting upon chalk is very thin, the chalky matter becomes mixed with it, and being then in excess, forms a barren soil.

An obvious means of amending the composition of a soil of this kind, is by adding any of the other earths, whether silicious or aluminous. We need not here scruple to apply them because the clay is coarse or the sand silicious. We may add them in almost any form in which they can be conveniently procured; for the effect will be to improve the composition of the soil.

There is another case in which, in like manner, silicious and aluminous matter may be applied directly in almost any state in which it may be found. This is in the case of peat. Here the vegetable matter is in excess, and the addition accordingly of any other earths is an amendment of the composition of the soil.

We see then, that the composition of soils may be improved by the addition of animal and vegetable matter, and also in many cases, by the addition of the earths in which they may be deficient, and in an especial degree, of lime, which we can always apply in the form of minute division best suited to improve the composition of the soil. This is the first of the means referred to of adding to the productive power of soils, and will be considered in detail under the head Manures, and other divisions of the management of the farm.

The *second* mean referred to of increasing the productive power of a soil, is altering its texture, depth and properties, by tillage and other means.

The mere effect of that comminution of the parts of soil which it undergoes in the common operations of tillage, is seen to have a beneficial influence on the productive powers of the soil. Whether the soil imbibes from the atmosphere any thing but aqueous vapor or not, it is known that the exposure of the matter of the soil to the atmosphere, and the comminuting of its parts by tillage, add permanently to its fertility. Thus we learn from experience the good effects of tilling lands well; soils once tilled are rendered for the most part more productive by the process. Peaty turf, if suffered to remain in its original state, may continue to produce nothing but heath and the most useless plants; but, if merely ploughed, and exposed to the influence of the atmosphere, it will at once tend to produce grasses of a better kind, and of greater variety; and again, if a subsoil of coarse clay be exposed to the atmosphere, for the first time, it is generally at the first very unproductive, and it is not until after long exposure to the air that it becomes productive. This is most remarkable in the case of clay marl, a substance in itself, containing the materials of a fertile soil, but which is often barren, until after pulverization and the influence of the atmosphere.

It is, indeed, conformable to analogy, as well as to experience, that soils should be improved by pulverization and exposure to the atmosphere. In our examination of the constituent parts of soils, we have seen that their fertility is in a great degree indicated by the proportion of minutely divided earthy matter which they contain.

The effect of tillage, therefore, may be reasonably supposed to promote this division, both by the mechanical action of our instruments, and by exposing the particles of the earth to the action of the air.

Another object sometimes produced by tillage, and subservient to the amendment of the soil, is the deepening of the upper stratum.

The subsoil, it has been seen, is distinguished from the soil so called, by its containing less vegetable and animal matter, and so being less suited to the nourishment of plants; and in many cases it is even found to be injurious to vegetation. It is generally important, however, that there be a good depth of soil, and thus it is often expedient, as a means of effecting a permanent improvement of the surface, to plough up and mix with it a portion of subsoil, even though that subsoil should in itself be infertile.

These, then, are the principal mechanical means by which we can improve the soil, and they will be considered in detail, under the various heads which relate to the operations of tillage.

Another mean, indeed, of changing the composition of soils, is incineration, commonly called *paring and burning*. This process will be described as connected with the operations of tillage, and may be considered as one of the mechanical means possessed by us of adding to the productiveness of the soil.

The *third* mean referred to, of adding to the productive power of soils, is changing their relation with respect to moisture.

In warmer countries the soil is comparatively little injured by an excess of water, and more frequently suffers from the insufficiency of it. In climates like that of Britain, however, the operation of conveying away the water which is in excess is an essential one, and if neglected, the devised scheme of improvement may fail. The surplus water is either stagnant upon the surface, or penetrates below the surface. The freeing of cultivated land of water upon the surface, gives rise for the formation of land into ridges, by which the water escapes without stagnating upon the ground, or sinking into the subsoil below. This is an object necessarily connected with tillage, and will be described when the manner of cultivating land is treated of.

The freeing of the soil again from that superfluous water which is contained below the surface, forms a peculiar branch of agricultural improvement, and will be described under the head of Draining.

As draining is more required in colder countries, so irrigation, or the watering of land, is less required than in those countries where the heat and evaporation are greater. Irrigation, however, is a curious and interesting branch of rural economy, derived by us from very ancient times. In this country it is chiefly employed in watering the lands in grass during the months of winter and spring.

The last of the means referred to of adding to the productive power of soils, is by changing the relation with respect to temperature.

This mean of adding to the productive power of soils, is less within our control than any of the others. It is only by slow degrees that we can improve the climate of a country. It is chiefly by draining, and the raising of hedges and wood; all of these, accordingly, form important objects of rural economy, and will be partially treated of in this work.

The means, then, of adding to the productive powers of the soil,—namely, supplying the organic and earthy substances which may be required; altering its texture, depth and properties, by mechanical means; and changing its relation with respect to moisture,—will all be treated of under the different divisions of our subject; and we shall begin with that which is most closely connected with the nature and property of soils, the nature and property of those substances which we apply to the soil under the name of manures.

Sheep Husbandry.

HINTS ON SHEEP HUSBANDRY.

[*Selected for the Cultivator.*]

Shelter.—It is obvious that housing sheep at night, and providing them, during the day, a shelter from the rain and sun, must preserve and improve the wool; and also essentially conduce to the health, comfort and preservation of the animal.—*Bakewell.*

I would have sheep winter fed, to the degree of commencing the grass season in good store order, and without having sustained any check, in carcass or wool; and winter sheltered in yards or sheds,

as much as the sheep themselves may affect, throughout even the mildest climates of Britain. For neither merino, nor half breed merino lambs, nor indeed those of any other breed, ought to be exposed without some kind of shelter, to the rigors of the winter and early spring; and the sheep, when arrived at their maturity or full strength, will still require the same, with regular and good feeding, if it be intended to force the growth of their fleece, to its utmost weight, and to preserve the quality in its highest degree of condition and fineness.—*Lawrence.*

One of the completest sheep yards I have seen, is that which Mr. Thurlow has made at Gosfield, partly by means of stubble stalks, but the space well enclosed; a large flock may be under cover or exposed, at their pleasure. In the centre is a thick stubble stack, which forms a double shed. He finds it of incomparable use, insomuch as he intends to convert all the straw of his large farm into dung, and to leave off buying bullocks for that purpose.—*Arthur Young.*

The late Gen. Murray's standing folds were equally well contrived, enclosing an area of 57 yards in length, and 20 broad, containing 1,140 square yards. Above 700 ewes were folded in it at night, and for that number it is more than a yard and a half for each sheep. All around it was a shed nine or ten feet wide, and also across the middle, which latter was open on both sides. A rack for hay, placed against the wall, which was boarded, surrounded the whole; and another, which was double, to be eaten out of on both sides, stood along the central shed; under the rack was a small manger, in which the food was given.—*Ib.*

A cool, moderate temperature is more favorable to the production of fine wool, than excessive heat; and were the sheep of Spain like those of England, unprotected against the effects of climate, I should have no hesitation in saying, that the situation of that country would be, in some respects, worse than that of our own island, and more unfriendly to the growth of a fine even staple. But to the other qualities, the soundness and softness of the fibres, our frequent rains are very prejudicial, unless the sheep be sheltered and protected from their effects.—*Bakewell.*

To preserve all the best qualities of wool in the Spanish breed of sheep, it will be necessary to attend to the three following objects: The first in importance, is the purity of the breed. The next, that the fleece be covered by nature with a copious yolk, or being deficient, that it be supplied by art; nor should the unctious covering of the wool be absorbed by a mixture with the soil on fallows, or washed away by the rain. Lastly, that the sheep be kept dry, sheltered from the extremes of heat and cold, und their quantity of nourishment regulated.—*Ibid.*

The bad effects of water upon the pile, while growing, may be owing to the readiness with which it mingles with the yolk, and carries off a quantity of that animal soap, which is so necessary to the good quality and even existence of the fleece; for if care be taken to prevent this, by the skilful application of tar mingled with butter, which act as repellants to the water, the wool part of the staple which grew after the mixture was applied, contains a sufficient supply of rich and nutritious yolk, and is a much superior sort of wool to those parts of the pile which have been exposed without protection, to the dripping wetness of the wintry season.—*Luccock.*

Mr. Bakewell is so fully convinced of the utility of greasing, that he advises it immediately after shearing, and again in October. In his opinion, the trouble and expense of it, twice a year, will be well repaid by its beneficial effects upon both the carcass and fleece of the sheep, in every part of Britain. He observes, by the first greasing, the wool will be covered and defended from the action of the soil, when the particles are most pulverized and active, and it will be kept soft and moist during the parching heats of July and August; and that he has reason to believe, that the top of the staple of a greased fleece, would not become harsh and discoloured, which is frequently the case with English wool. Additional and very powerful inducements to spring and summer greasing, are the following: The ointment destroys the sheep tick, and has a tendency to prevent cutaneous distempers, and to preserve sheep from the stroke of the fly. Farther—a considerable quantity of wool will be saved, which is torn off by sheep when rubbing themselves, in order to allay the irritation of the skin, occasioned by those causes. The ointment resists the action of the moisture more powerfully than could the natural yolk of the wool; and Mr. Bakewell gives an example of the superior warmness and dryness apparently enjoyed by greased sheep, on the mountain sides, where greased and ungreased browsed together.

The following is given as the Northumberland preparation:—From 16 to 20 pounds butter, are placed over the fire and melted; a gallon of tar is then added, and the mixture is stirred until the two substances are well incorporated and form a soft tenacious ointment. The care always necessary in the application of ointments to the sheep, is especially so in this case; for, says Mr. Bakewell, *if the ointment be merely rubbed on the wool, it collects on the top of the staple, attracts and mixes with the soil, and is rather injurious than beneficial to the fleece.* The staples of the fleece are to be divided with one hand, and the ointment applied to the skin with the finger of the other hand, by which means the ointment is softened by the warmth of the skin, and equally diffused throughout the fleece.—The quantity required will in course vary with the size of the sheep, but generally, and in the lighter mode of greasing, one gallon of tar, and 20 pounds of butter will be sufficient for forty or fifty sheep.—*Lawrence.*

An unfavorable change takes place on shorn wool, kept long in a very warm and dry temperature: the fibres become indurated, rigid and elastic, and acquire the properties of the hard wools. The greater the degree of warmth, the more speedily will the effect be produced. Wool which has been shorn three or four years, will not spin or fill so well as when kept only one year. A dry situation is necessary for the preservation of wool, which however at length loses it natural moisture, and becomes hard, like wool of limestone districts.—*Bakewell.*

Sheared sheep, turned into a newly mown pasture, their coats attract the short ends of grass left by the scythe, and remain sticking in the bottom of the fleece, until in the end they are rolled up with it. These with any dried vegetable particles, such as hay seeds or chaff, falling from the rack into the coat of the sheep, occasion much extra trouble and expense in the manufacture of the wool, since if left, they would be wrought into the substances of the cloth, whence they must be extracted by holes made, to be afterwards repaired at the fulling mill, or by the fine drawer. Hay in racks should be upon the level with the heads of the sheep, and the staves by no means too wide apart, since some sheep, particularly the Spanish, are the most wasteful animals in the world of their provisions.—*Luccock.*

The wool grower is counselled to place no dependence upon accidental and external circumstances, for the production of good fleeces, but to rely entirely and with confidence upon the properties with which nature has endowed his sheep. The perpetuity of animal properties being scarcely anywhere more strikingly exhibited, than in the certainty and regularity with which the parent sheep convey to their offspring their own distinguished characteristics. Breed is of the utmost consequence. It is the basis upon which all the improvements of the flock must be founded; the only source of hope, that attempts to produce fine wool will be followed with success.—The kind of wool depends entirely on the species of sheep which bears it, and the soil and its products, or other external circumstances, have no other effect than to vary the quality of the sample, the wool itself still remaining true to its species, long, short or mixed. Long and universal experience has established the fitness of heavy, coarse woolled sheep for rich and grazing grounds and marhes, confining the light and short woolled stock to the hills and higher pastures. Nevertheless, fitness and propriety, not absolute necessity, have given birth to such arrangement; since short and fine wool might be grown in the low grounds, and long wool in the upper, with an additional expense of winter keeping.—*Lawrence.*

Miscellaneous.

[*From the Genesee Farmer.*]

RUTA BAGA CULTURE.

In giving you last year an account of my first experiment in turnip culture, I mentioned my intention of continuing to raise them, as I was convinced few things could be more profitable. In order to be certain of having first rate seed, I sent last winter to Mr. Buel, at Albany, and procured half a pound of seed, having a quantity of my own raising to make up any deficiency, should there be any.—The ground selected was a wheat stubble, was not manured, but thoroughly ploughed, and then thrown into ridges, as described last year. On these ridges the seed was sown by hand at the distance of ten inches. The seed procured at Albany was sufficent for the

whole acre, and a small quantity was left. The time occupied in sowing was about a day and a half. I sowed them a few days earlier than last year, viz. on the 16th of June; as they appeared last year to be in full vigor at the time of pulling. I gathered them the first week in November, and from the acre sown with the Albany seed, measured 450 bushels of very fine smooth turnips. Nearly one-fourth of the ground sown was inclining to clay, and in some places produced no turnips; thus furnishing another proof of the correctness of Judge Buel's remark, that clay ground is unsuited for a turnip crop. Owing to an unusual pressure of farming business, my turnips were hoed but once, which was at the time of thinning —the first week in August. My account with ruta baga for the year 1834, will stand as follows:

Ploughing twice, and ridging,	$3 00
Seed,	75
Six days, work, thinning and hoeing,	4 50
	$8 25

The tops will pay for the use of the land and the gathering.—Four hundred and fifty bushels of turnips, at twenty cents per bushel, would be $90 leaving a profit of something like eighty dollars.

There is an impression among some people, that capital employed in farming is but poorly invested. It may in some cases be so, but such is not the result necessarily. The land on which my turnips were this year raised, was part of a small field of four acres, which had been a meadow for several years, but the grass becoming thin and poor, it was, after the mowing in 1830, turned carefully over, dragged on the furrow with a light drag, and sown with wheat. After the wheat was taken off, a quantity of manure was, in the fall of 1831, put on the stubble, and the whole ploughed in. In the spring of 1832, it was again ploughed and sown with barley. The barley stubble was ploughed in and the field again sown with wheat. In the spring of the present year, the wheat stubble was turned in, and the piece rolled down smooth, and three acres planted with corn. As the ground had been carefully levelled, the corn was planted in rows two feet and a half apart, and the hills eighteen inches from each other in the rows; at the first hoeing three stalks were left in a hill. It was hoed twice, the principal part done with a cultivator, and the corn was hilled as little as possible. At gathering it was estimated to yield from 65 to 70 bushels an acre; and one acre was sowed with the turnips. The avails of this four acres for the four years will be as follows:—

1st crop,	100	bushels wheat, 8s	$100 00
2d	120	barley, 4s	60 00
3d	90	wheat, 8s	90 00
4th	195	corn, 4s	97 50
	450	turnips 20 cts	90 00
			$437 50

No account of the expense of culture was kept except for the last two years, and as it will be seen at a glance that it was performed in the simplest manner possible, on comparing it with recorded results, I am confident that thirty per cent would be a liberal allowance for seed, labor, &c. leaving a profit on the four acres for the four years of about three hundred dollars.

It has been frequently remarked that small farms were more profitable than large farms. This is no doubt in most cases true; and it is easily accounted for by the fact that on well cultivated small farms, much more capital is employed on the land in the shape of labor, manure, &c. than upon large farms. A small farm bears the same relation to a large farm in this respect, that the garden of the small farm does to the remainder. Where the soil is naturally equally good throughout the whole farm, let it be small or large, it might be made as productive and profitable as the garden, were the same capital employed upon it. In farming, as in most other kinds of business, it is idle to expect something for nothing; the returns in nine cases out of ten will be in proportion to the labor bestowed.

Otisco, December 5, 1834. WILLIS GAYLORD.

EXTRACT FROM THE VALEDICTORY OF MR. LEGARE TO THE PATRONS OF THE SOUTHERN AGRICULTURIST.

The subject of the Rotation of Crops and Manures—should command your serious attention. Without referring to the mooted point of what is the cause, or entering in the least into the discussion, it is sufficient for us to know, that any vegetable grown long on the same soil deteriorates, even when the ground is annually manured, unless the manure used possesses the peculiar nutriment fitted for it, and so true is this admitted to be, that it is acted on even by the market gardeners, near London, where rents are enormous, and manures made free use of. It is stated, moreover, on high authority, that it is a practice with them to lay down a part of their grounds in grasses, finding that the rotation of garden vegetables is not sufficient, and that by pursuing this course, their profits are increased.

If then it be so necessary, where manures are used to such an extent, as would astonish us in this country, how much more necessary must it be where so little is used, and where the supply is so limited? Rotation of crops, is in some measure, a substitute for manuring, and it is well known, that after plants of a certain class, have exhausted the soil of all nutriment which will support them, other plants will grow most luxuriantly on it, and be for sometime very productive. These, in turn, exhaust the soil of their peculiar food, and have to yield their places to others. And such is the course pointed out by nature throughout the vegetable world, whether it be in the forest or in prairie, the cultivated or uncultivated lands.

But a rotation of crops can seldom, if ever, be substituted for manuring, and should never be considered in that light, for although each plant may have a certain specific food, without which it cannot thrive, and which it may obtain by a change of soil, and which is not necessary for the healthy growth of other plants, which are to succeed, yet there are certain elementary constituents necessary for all plants, and which are required by all and consumed by all, and which can only be supplied by the annual decay of the vegetables which grow on the soil, or by manures. Where the operation is left to nature, the first takes place, but when man interferes, the second must be resorted to. The object, however, of manuring should not be merely to keep the soil at its pristine fertility, but to improve and make it more productive. To effect this, care should be taken that a greater quantity is added to a field than is taken from it. Nor should it be a matter of indifference what manure is carried into particular fields, for while some manures would be exceedingly beneficial in one field, they might be inoperative or the very reverse in another. Nor is it always necessary that the manure should contain either vegetable or animal substances. To a stiff clay soil, the addition of pure sand very often proves highly beneficial, and clayey is the proper corrective of a light soil. Wood ashes, lime and marl, are most excellent manures when properly applied. But of all manures, that which is obtained from the stable and farm-yard, is the most beneficial, and consequently most to be prized. The greatest attention, therefore, should be paid to the collecting and augmenting of it. We need not here enter more fully into this branch of our subject. Our readers need only to refer to the back volumes of this journal for all information necessary. The subject is undergoing investigation daily, and as these investigations shall bring to light new discoveries, they will be given in the *succeeding numbers* of this work.

The next subject we call your attention to, is the care of your *Live Stock*. It is all important to a planter, that he should have an ample supply of manure; with it he goes on to realize a fortune, and without it, he will at best, but remain stationary. How many planters have been ruined, and how many are there, who scarce make their income and expenditures meet; in many cases this is more owing to a neglect of collecting and applying manures, than any other cause. Content with what the natural fertility of the soil yields, the productions of their fields become less in each succeeding year, and instead of supplying the waste which takes place, by the application of manures, they, in many cases, emigrate to the "far West," leaving all the comforts of civilization, and tearing asunder all the tender ties of early life. Others are content to drag on thus, provided they can but live; when it would require but little exertion on their part, to place them in comfortable, if not affluent circumstances.

A proper attention to the stock of the plantation, (for all have more or less,) would go far to relieve the embarrassments of the planter, in this respect. Let his horses and cattle, his sheep and hogs, be properly attended to; let them be taken care of, during winter, and have their pens well littered, and he will be amply repaid by the quantity of manure he will have in the spring, to enrich those spots which are poorest. But even apart from the additional quantity of manure which would be made by proper attention, the many comforts yielded by a well kept stock of cattle, sheep and hogs

are sufficient inducements of themselves, to cause us to pay more attention to them than we do. Instead, therefore, of permitting them to roam at large during the winter, and losing a large number annually in the bogs of the swamps, let them be housed, fed, and well littered. Let no one say that this cannot be done, or only accomplished on a small scale. The success which has attended Dr. H. Ravenal, refutes this opinion. His stock is large, they are all housed and fed during the winter, and this is done by him, on three separate plantations, on each of which, the number of cattle, sheep and hogs, are considerable; nor does Dr. Ravenal possess any facility for feeding them, not within the reach of all planters; but he is provident, and his cattle fare well.

EFFICACY OF SPIRITS OF TURPENTINE IN DESTROYING INSECTS.

M. D. Thosse, in Silliman's Journal, after describing the efficacy of spirits of turpentine in destroying lice, &c. upon animals, gives the following narration of his experiments with trees.

"Having learned these facts, I soon found occasion to try its effects on some of my trees, which were attacked by a multitude of worms. These I destroyed entirely by putting into a bowl a few handsful of earth, on which I poured a small quantity of the spirits—then adding water, and stirring the whole together until it had a proper consistence to be rubbed or brushed over the ends of the branches. The insects perish with their germs; and the odor remaining several days about the tree, repels fresh invaders. A mixture of earth is necessary, because spirits of turpentine swims upon pure water and will not mix with it; and if used in too great quantities, might burn the leaves.

"The drought which occurred a few years ago in the canton in which I live, produced a mange in cattle and horses, very extensive and injurious; and those who escaped this infection were filled with lice, from which they were promptly relieved by sponging them with water impregnated with the spirits. This infection caused horses fatigued with labor to rub themselves so much against their mangers and the walls of the stables as to deprive them of much of the rest so necessary to their comfort.

"I cannot therefore doubt, from the trials that have been made, that much benefit might result from the use of turpentine in clearing fields and trees from insects of different kinds; and that a mixture of ashes with which a portion of this liquid has been incorporated, would remove, by its odor, ticks and other insects which infest turnips. Its odor is more penetrating in the open air than that of sulphur, and some other materials used for this purpose."

[*From the Genesee Farmer.*]

QUERY TO FARMERS.

Winter has come, and what provision have you made for passing the long evenings for the four ensuing months pleasurably and profitably to yourself and others? The farmer who thinks it will do now, as formerly, to sit by the fire and drink cider, and tell stories through the winter, has not kept pace with the spirit of the times; he is lamentably behind the spirit of the age in which we live. There has, it is evident, a certain class of individuals grown up in our land, who speak of and treat the cultivators of the soil as an inferior caste, men who cannot understand the leading topics of the day, whose utmost abilities are confined to the merit of being able to discuss a boiled potato and a rasher of bacon, and who ought not to be entrusted with legislating for themselves, much less for others. If as a body the farmers are obnoxious to this reproach, we surely should lose no time in correcting the evil—if, as is believed, these aspersions are calumnious, they must be lived down. The farmer has no excuse for ignorance. Information on all the useful and necessary subjects which come before us as men, and citizens, is presented in shapes so easily accessible, that he who remains ignorant deserves to be a reproach and a by-word. Let no one think, then, that he is prepared for winter, who has not made arrangements for a liberal supply of food for the mind as well as the body. Well conducted papers, able periodicals, and valuable books must be procured, and they must be read and studied. Universal education is our boast, but it is foolish and vain-glorious, unless it is turned to useful purposes. Every farmer should be a practical utilitarian; "Cui bono," should be his motto; every day should witness some profitable acquisition of knowledge. A few dollars a year paid out for well selected and standard works will, in the course of a few passing years, provide a farmer with a valuable library. The farmer who has a family, is inflicting on them a cruel and irreparable wrong, if he by his negligence or his parsimony deprives them of such a resource. The young cannot be idle, and their time if not profitably employed will be perhaps worse than thrown away. W. G.

[*From the Maine Farmer.*]

From unpublished papers of the Kennebec County Agricultural Society.

ON THE CULTURE OF TEASELS.

As teasels are very excellent materials to card cloth, and as no cloth can be dressed so well without them as with, I have thought proper to communicate the mode of their culture to the society.

In the spring I sow the seed in rows six or eight inches apart; as soon as the plants are up enough, I weed them. In the fall of the year, I cover them with bushes, and in the spring I dig holes down to the plants to prevent their winter killing. The next spring I set them out, four or four and a half feet distant; it is not proper to nourish them this year, for if you do, there will more of them go to seed than otherwise would. I sow more seed the second year, to set out in the missing places, as they will die as soon as they have been to seed. The third year I nourish them as much as possible, to make them as large as I can, as they will be better. As soon as the blossoms are fallen, I cut and spread them on a floor to dry.

I get for the best, one dollar per hundred, and down to twenty-five cents.

Communicated by ELIJAH WOOD.

To the Committee of the Kennebec County Agricultural Society, appointed to award premiums on honey, hives of bees, &c.

Having entered my name for premium on honey and on hives of bees, I will inform you how I have managed them for a few years past. I keep them in boxes—my boxes are thirteen inches square on the outside, and from six to seven inches high, with thin slats across the top about an inch wide, with just space enough to let the bees pass between them. For a young swarm I fasten two boxes together with a board on the top, put in the swarm, and when I set them on the bench, put under as many more as I think they will fill—a large early swarm will fil four or more. I had some this season that filled three in about a fortnight, and then swarmed, and the young swarms have filled four boxes. After my old hives have swarmed once, I usually put under one or more boxes. I prefer that course, to letting them swarm again, for second swarms are generally worthless. When the weather becomes cool, if the hive is well filled with honey, the bees will all leave the upper box,—it can then be taken off without disturbing the bees in the hive. I usually take from my old hives and early swarms one box containing from twenty to twenty-four pounds, and leave enough for the bees to live on through the winter, or I can take a part, and return the box if I think the remainder is insufficient for them. If my bees grow lazy after the swarming season is over, and hang out on the hive, which is in consequence of the hive being full, I add more boxes. I had a few small swarms which I have taken up otherwise. I have not destroyed any bees. I have taken up on my own farm this season, 289 pounds of good honey in the comb, and I now own, including those that I have taken up, twenty-six hives.

Leeds, Dec. 15, 1834. JOHN GILMORE.

M. Rennici, a French chemist, has discovered and described the *itch insect*, sometimes denominated the *Scotch fiddle*. It is the *acarus scabici*. Like the mole, it has its fore legs strongly developed, while its hind quarters are comparatively feeble; it is thus enabled to burrough under the cuticle, and to make a road for itself as it proceeds. M. Raspael, whose skill in exploring minute objects is so celebrated, is engaged with his microscope in procuring farther details.—*Medical Gazette.*

The cost of producing and marketing a crop of hops, has been computed, by those well acquainted with the business, not to exceed *eight cents* per pound; and the common yield at full fifteen hundred pounds to the acre. The price in the market this year, is from eighteen to twenty cents per pound, yielding a nett profit to the farmer of full twelve cents on every pound of hops, after paying outlays of every description. This computation gives *one hundred and eighty dollars* clear income for every acre of land in growing hops.—*Sag-Harbor Telegraph.*

Potatoes.—It has been a mooted question whether it is a good plan to cut potatoes in planting. A correspondent of the New-England Farmer, Ellsworth, has made an experiment, by planting an acre in

alteratte rows. The rows of uncut potatoes produced 458 bushels; the cut potatoes produced 336; making a difference of 123 bushels in favor of the uncut. He however used 22 bushels more of seed in planting the uncut potatoes.—*Kennebec Journal.*

Young Men's Department.

[*From the Farmers' Register.*]

ON THE PLEASURES OF AGRICULTURE.

Independent of the actual profits arising from agricultural pursuits there is something in the cultivation of the soil, eminently calculated to dispose the philosophic mind to serious and sublime contemplation. With your permission, Mr. Editor, as I have seen no communication of this character in the Register, I shall endeavor to show wherein consist the real delights which the philosopher and man of science derive from agriculture. And I undertake this service the more willingly, from the fact that there are many young men, who, from the mere consideration of gain, can never be induced to lay aside their prejudices and become tillers of the soil, but who might be induced to make the experiment, and finally become good farmers, could the subject be presented to them under a pleasing aspect. To those speculative young men who desire amusement as well as profit in their avocations, the present and succeeding numbers I may find leisure to write upon this interesting subject, is respectfully dedicated.

Although the desire of gain is a principal and most necessary inducement to follow the plough, yet all must admit, that he who sees no other pleasure in agriculture than that which results from the anticipations of pecuniary profits arising therefrom, is, to say the least, a *grovelling and penurious wretch.* There is something really mean and sordid in overlooking all the beauties of the vernal spring, and the maturing loveliness of autumn, merely to contemplate the amount of *dollars* to be received in return for the daily toil and anxious solicitude of the farmer. Such a disposition reminds one of the folly a man would evince, who should prefer a dark and loathsome cell to the cheerful beams of day, and the pleasing aspect of creation. But to him who looks from nature up to nature's God, and who can recognize the Diety in every expanding, opening flower, and purling rill, agriculture offers charms, calculated to compose the mind, and dispose it to tranquillity and cheerfulness. To such a mind—

> "——Not a breeze
> Flies o'er the meadow; not a cloud imbibes
> The setting sun's effulgence; not a strain
> From all the tenants of the warbling shade
> Ascends, but whence his bosom can partake
> Fresh pleasure unimproved——."

Who can look upon a field of wheat, gradually rising in vernal loveliness to the delighted eyes of the contemplative beholder, and mark it in all its different stages, until the ripe grain crowns the hopes of the husbandman with a golden harvest of plenty; and then have the heart to distrust the protection of Providence, or doubt the existence of an All-wise Intelligence, pervading and governing all things; assigning bounds to the elements, and transcribing the limits of nature? There is not a blade of grass or ear of corn, that does not afford matter of curious and endless speculation to the inquisitive and well cultivated mind. And although upon philosophical principles only, no man can ever understand the process of nature, by which the earth in spring is clothed with verdure, and in the autumn filled with her bountiful productions, gradually maturing for the sustenance and pleasures of man; yet the heart by such inquiries, must be ultimately greatly benefitted. No man who sees, and contemplates the design and wise contrivance of all the plants and vegetables, that clothe and adorn a well cultivated farm, and reflects upon the inexplicable nature of their existence, fructification, and preservation, under so many adverse circumstances, can have the heart to be a sceptic in regard to our holy religion—because many parts of it are surrounded with mystery. He finds that mystery is inscribed upon the face of all things, and what he cannot understand upon principles of reason, he learns to adore as the production of an infinite and incomprehensible Being. The man of reflection sees much to admire in the great care which nature manifests for her productions, even in the protection she affords to the grasses which cover our meadows and fields. For not only do they clothe and adorn the fields, but they afford sustenance for all animated existence. The leaves afford food for the cattle, the smaller seeds for birds, and the larger for man: for few readers need be informed that the plants producing our bread corn belong to this class. In those tribes *more generally* considered as *grasses*, I will mention the following as instances which appear to coinside with the intention of nature concerning them, viz: their extraordinary means and powers of preservation and increase, their hardiness, their almost unconquerable disposition to spread, and their faculties of reviviscence, each of which qualities, considered in detail, would afford interesting matter for a separate communication. In this, therefore, I can only observe the following things in relation to their general properties. They thrive under a treatment by which other plants are entirely destroyed. In proportion to the consumption of leaves is the increase of the roots. The more the cattle trample them under foot the thicker they grow. Many of the seemingly dry and dead leaves of grasses revive and renew their verdure in the spring. In lofty mountains, where the heat of summer is not sufficient to ripen seeds, we are told that the grasses are viviparous, and consequently able to propagate themselves without seeds. It is also an observation frequently made, that herbiverous animals attach themselves principally to the leaves of grasses, and if left at liberty in the pasture to range and choose, will leave untouched the straws which support the seed. These general properties of vegetables, or properties common to large portions of that kingdom, are all that the extent of the present communication will allow me to notice, as I am afraid of being deemed too prolix by that class of society for whose benefit I write. But I may here be permitted to ask, whence this admirable contrivance of nature, this adaptedness of the productions of the earth to the peculiar condition in which they are placed, and their perfect subserviency to the uses for which they seem to be designed? Shall we inscribe it to the operations of nature herself? Or looking through nature, shall we desern an ever present wise Deity, though "invisible or dimly seen in these his lower works," yet superintending and graciously directing all things for the comfort and convenience of his creatures?

In conclusion, I would only observe, that I have just entered the threshold of the ample subject before me. I hope, however, that I have said enough in this communication to impress this general truth, that in the cultivation of the soil, there are thousands of objects calculated to expand the mind, increase the understanding, soften the heart, destroy scepticism, and exalt our ideas concerning the Ruler of the Universe. In my next, should the subjects of the present communication come within the design of a journal exclusively agricultural, I will resume the subject more in detail. W. H. P.

Gillespie's, Buckingham, Oct. 14, 1834.

MAXIMS.

How can a mean man serve the state? When out of office, his sole object is to *attain* it; when he has attained it, his only anxiety is to *keep* it; and in this uprincipled dread of *losing* it he is ready to go all lengths.—*Confucius.*

The generality of men expend the early part of their lives in contributing to render the latter part miserable.—*La Bruyere.*

A rolling stone gathers no moss.—*Latin.* This may be applied metaphorically to many dissatisfied mortals, whose "unstaid tendencies" will not permit them to remain long in any one place; who waste their substance in their migrations, and whose circumstances consequently never improve.

The discovery of what is true, and the practice of that which is good, are the two most important objects of philosophy.—*Voltaire.*

Money is a good servant, but a dangerous master.—*Bonhouse.* When we employ it to good purposes, money is a great blessing; but when we use it for wicked ends, or become so devoted to it as to endeavor to acquire it by dishonest means, it is then indeed a bad master.

Advancement is to merit, what the ornament of dress is to handsome persons.—*French.*

Merit often proves an impediment to prosperity; the reason is, that it always has two bad effects, producing feelings of envy and fear.—*Fr.* Envy from those whom we excel, and fear from those whose pretensions we might set aside.

The most delicate, the most sensible of all pleasures, consists in promoting the pleasures of others.—*La Bruyere.* How happy would it be for the world, if all men were to make this sentiment the rule of their actions!

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